Telephony.

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THE MAN WHO DOES NOT DO HIS BEST.

The man who does his best may never lead the procession, but the man who does less than his best is fore-doomed to be a "tail-ender."

Drawbacks of Government Ownership.

If government ownership of the telephone lines is so much desired—as some more or less astute American statesmen assert—why do the foreign nations which have adopted that system find it necessary to send their telephone managers to the United States to acquire information about giving good service? From England, Germany, France, Australia and many other countries where the government runs the telephone business, men in the employ of the state come every year to study American methods and absorb American ideas to improve their none too efficient systems.

They have repeatedly said that they look to the United States for what is best in the management of a telephone plant. These men are not novices, either, but experts of fine education, intent on performing their work well. Government ownership, however, has hampered them. Red tape and governmental restrictions have made theirs a hard job, and made it well nigh impossible for them to give the public a telephone service such as has come to be expected in this country.

Where a telephone company is privately owned, and depends on voluntary public support to become a commercial success, the management wastes no time nor effort nor—occasionally—expense in meeting the public's demands. If the company officials see they should make an expenditure in building a new line, they go ahead and do it.

Under government ownership, however, the managers may perceive such a requirement, but be unable to proceed because of the red tape that hinders nearly all state departments. Appropriations have to be made and, in most cases, the actual authorization of expenditures depends on administrative or legislative bureaus little acquainted with telephone practice, and that of course means endless delay. The practical telephone men on the job find themselves tied hand and foot. With a slow-moving bureaucratic set of superiors on one hand and a dissatisfied public on the other, their lot is anything but a pleasant one.

Government ownership has retarded the use of the telephone wherever it has been established. In all of the United Kingdom there are only about as many stations as two American cities—Chicago and New York—possess. Chicago alone has more telephones than all of France. London, the greatest city of the world, with a population of 7,000,000 people, has only 245,000 stations. Manchester, with a population of 1,200,000, has less than 30,000 telephones—less than half as many as has Baltimore, which has only half as many people.

These comparisons could be multiplied indefinitely, showing how the telephone has reached its greatest usefulness under private enterprise, while lying comparatively stagnant under the blight of government ownership. And so far as efficient service under these two conditions is concerned, everybody knows what the simple facts are. The "Letters from the People" departments in the big English daily papers are full of communications from dissatisfied telephone subscribers who have been unable to get any relief from the government managers and can only find a vent for their disgust by writing to the editor. Many of these correspondents are prominent men who have traveled, and it is astonishing how often the letters compare the wretched service in England to the efficient telephone systems of the United States.

The same is more or less true of all countries having government-owned telephones. Travelers in France, particularly, come home amazed and angry at the miserable service given in that country. If the great mass of the people in foreign countries were familiar with the telephone service characteristic of the United States, and were given a chance to vote on the question, there is no doubt such a referendum would abolish government ownership of telephones. In fact, the quality of government-owned telephone service is almost enough to justify what the militant suffragettes are doing in England these days.

Advertising and the Trade Papers

By ELBERT HUBBARD

The widespread interest in the subject of advertising is revealed in the formation of clubs to study the theme from every point of view. The "Adscript," "Publicity," "Adcraft," and "Poor Richard" Clubs combine in their membership the brightest and most progressive minds in their respective communities.

He who imagines that modern advertising is the exploitation of the public is a biouspidati diplidocus, and would do well to come out of his comatose state and currycomb his convolutions.

Advertising is information as to who you are, where you are, and what you have to offer in the way of skill, talent or commodity. To hold the old customers, you must get out after the new. The reputation that endures, or the institution that lasts, is the one that is properly advertised.

The only names in Greek history that we know are those which Herodotus and Thucydides graved with deathless styli. The men of Rome who live and tread the boardwalk are those Plutarch took up and writ their names large on human hearts. All that Plutarch knew of Greek heroes was what he read in Herodotus.

Life, now, is human service. To deceive is to beckon for the Commissioner in Bankruptcy. Nothing goes but truth. We know this—because for over two thousand years we have been trying everything else.

"Truth," says Dr. Charles W. Eliot, "is the new virtue."

The "Let-the-truth-be-known-about-your-business" idea has inspired the best firms to tell of their products to trade paper subscribers.

The only man who should not advertise, is the one who has nothing to offer in the way of service, or one who cannot make good. All such should seek the friendly shelter of oblivion where dwell those who, shrouded in Stygian shades, foregather gloom and are out of the game.

Not to advertise is to be nominated for membership in the Down-and-Out-Club. The Adscripts and the Adcrafts are opposition societies to the Mummy Trust. They worship the rising sun. The oleo of authority does not much interest them. They want the Kosmic Kerosene that supplies Caloric.

A good advertiser is never either a philophraster or a theologaster—he is a pragmatist. He seeks the good for himself, for his customers, and for the whole human race.

The science of advertising is the science of psychology. And psychology is the science of the human heart.

The advertiser works to supply a human want; and often he has to arouse the desire for his goods. He educates the trade or public to what it needs, and what it wants, and shows how and where to get it.

We are living, inventing and changing so fast, and there are so many of us, that he who does not advertise is left to the spiders, the cockroaches and the microbes. The fact that one has all the business he can well manage now is no excuse for not advertising.

All that Shakespeare knew of classic Greece and Rome, and the heroes of that far-off time, is what he dug out of Plutarch's Lives. And about all that most people know of Greece and Rome they got from Shakespeare.

Plutarch boomed his Roman friends and matched each favorite with some Greek, written of by Herodotus. Plutarch wrote of the men he liked, some of whom we know put up good mazuma to cover expenses.

All literature is advertising. And all genuine advertisements are literature. The author advertises men, times, places, deeds, events and things. If he does not know the heart throbs of men and women, their hopes, joys, ambitions, tastes, needs, and desires, his work will interest no one but himself and his admiring friends.

Advertising is fast becoming a fine art. Its theme is "Human Wants," and where, when and how they may be gratified. And since the subscriber, too, must fill such wants, he profits by absorbing and reflecting these truths in trade paper advertising.

Advertising interests, inspires, educates, sometimes amuses—informs, and thereby uplifts and benefits, lubricating existence and helping the old world on its way to the Celestial City of Fine Minds. And especially does the trade paper know the science of advertising.

First, the trade paper carries no shady or uncertain advertising. Everything that treads the border line of bunco is eliminated.

The subscriber to a trade paper is, or should be, as much interested in the ads as in the text; both inform, uplift and inspire.

The trade paper is in partnership with its subscribers—the interests of each are identical. The trade paper exists for this one reason—to render a tangible aid to the subscriber.

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Report of American Telephone & Telegraph Co. for 1913

Abstract of Annual Report Giving Data Relative to the Continued Growth of Bell System, Its Earnings and Expenses—Condensed Statements Covering Details of Organization's Financial and Physical Condition—Engineering Matters

[Editor's Note: The annual report of the American Telephone & Telegraph Co., covering its operations for the year 1913 and signed by its president, Theodore N. Vail, devotes considerable space to a discussion of government ownership. The following abstract of the report does not include the correspondence which passed between the company and the officials of the United States Department of Justice, as that has already appeared in TELEPHONY. The report also sets forth in detail its relation with the Western Union Telegraph Co., which likewise has been discussed in TELEPHONY.]

BELL TELEPHONE SYSTEM IN UNITED STATES.

At the end of the year the number of stations which constituted our system in the United States was 8,133,017, an increase of 676,943, including 215,181 connecting stations. Of these, 2,717,808 were operated by local, co-operative and rural Independent companies or associations having sub-license or connection contracts, so-called connecting companies.

The Bell telephone toll lines of the United States now reach 70,000 places, from many of which a telegraph message can be sent. The extent of the system is best realized by comparison with less than 60,000 post offices, 60,000 railroad stations and regular telegraph offices at about 25,000 places.

The total mileage of wire in use for exchange and toll service was 16,111,011 miles, of which 1,500,198 were added during the year. Of the total mileage nearly 13,800,000 miles were exchange wires, and over 2.300,000 toll wires. These figures do not include the mileage of wire operated by connecting companies. Of this total wire mileage 92 per cent. is copper wire, 8,817,815 miles are underground, including 543,923 miles of toll wires in underground cables. The underground conduits represent a cost of $85,700,000 and the cables in the conduits $95,800,000—a total in underground plant of $181,500,000.

TRAFFIC.

Including the traffic over the long distance lines, but not including connecting companies, the daily average of toll connections was about 806,000, and of exchange connections about 26,431,000, as against corresponding figures in 1912 of 738,000 and 25,572,000; the total daily average for 1913 reaching 27,237,000, or at the rate of about 8,770,-300,000 per year.

The following figures compare the telephone traffic with the two other branches of transmission of intelligence—the mail and the telegraph—in the United States and in Europe during the year 1912:

Type of Message.	Europe Number During 1912	Europe PerCent. of Total Europe	United States Number During 1912	United States PerCent. of Total U. S.
First class mail matter	17,775,000,000	71.2	10,212,000,000	39.4
Telegrams	388,000,000	1.5	113,000,000	0.4
Telephone conversations	6,809,000,000	27.3	15,600,000,000	60.2
Total	24,972,000,000	100,0	25,925,000,000	100.0

In other words, although Europe has about three and a half times the telegraph traffic of the United States, and nearly twice the first class mail traffic, it has only two-fifths the telephone traffic of the United States.

The use of the telegraph in Europe was about 2 per cent. of the mails, while in the United States it was but 1 per cent., the greater efficiency and distribution of the telephone causing the difference.

PLANT ADDITIONS.

The amount added to plant and real estate by all the companies, excluding connecting companies, constituting our system in the United States during the year 1913 was $54,871,856, distributed as follows:

Real estate	$ 6,109,675
Equipment	16,419,143
Exchange lines	23,461,226
Toll lines	8,803,441
Construction work in progress and undistributed plant	78,371
	$54,871,856

The amounts added in fourteen years have been as follows:

1900	$31,619,100	1907	$52,921,400
1901	31,005,400	1908	26,637,200
1902	37,336,500	1909	28,700,100
1903	35,368,700	1910	53,582,800
1904	33,436,700	1911	55,660,700
1905	50,780,900	1912	75,626,900
1906	79,366,900	1913	54,871,900

making a total for the fourteen years of $646,915,200.

Estimates of all the associated operating companies and of the American Telephone & Telegraph Co. for all new construction requirements in 1914 have been prepared. It is estimated that about $56,000,000 will be required for current additions to plant in 1914, of which amount some $25,000,000 will be provided by the existing and current resources of the companies.

MAINTENANCE AND RECONSTRUCTION.

During the year $70,183,000 was applied out of revenue to maintenance and reconstruction purposes; of this, over $13,000,000 was unexpended for those purposes.

The total provision for maintenance and reconstruction charged against revenue for the last ten years was over $457,000,000.

The necessity of providing fully for that depreciation which comes from obsolescence continues and will continue so long as the improvement of the equipment, apparatus and service, and increase in possible distance of communication continue.

Limited local service can be given by a plant that would be useless in a comprehensive system made up of local exchange and toll, and particularly in connection with long distance service. Although 90 per cent. of the connections are purely local, the 10 per cent. that are not local are more important and of a greater necessity than the 90 per cent. local and must be equally available through one station equipment. For that reason the Bell plant must be maintained at a higher standard than would be necessary if it were a purely local exchange service.

Improvements in service and particularly in equipment and operating methods have been continuous and so gradual that it is hard to realize the extent of them. Those familiar with the service five years ago and not in touch

with it again until the present time, would recognize and appreciate the changes which those in daily touch do not realize and cannot fully appreciate. In that time the radius of conversation has doubled. It is easier to talk with Denver today than with Chicago then, and with the completion

BELL TELEPHONE SYSTEM IN UNITED STATES.

COMPARISON OF EARNINGS AND EXPENSES, 1912 AND 1913.

(ALL DUPLICATIONS, INCLUDING INTEREST, DIVIDENDS AND OTHER PAYMENTS TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY BY ASSOCIATED HOLDING AND OPERATING COMPANIES, EXCLUDED.)

	1912.	1913.	Increase.
Gross Earnings	$199,172,154	$215,572,822	$16,400,668
Expenses—Operation	$ 65,246,677	$ 75,404,092	$10,157,415
Current Maintenance	31,762,636	32,442,979	680,343
Depreciation	34,942,802	37,739,991	2,797,189
Taxes	10,333,349	11,296,237	962,888
Total Expenses	$142,285,464	$156,883,299	$14,597,835
Net Earnings	$ 56,886,690	$ 58,689,523	$ 1,802,833
Deduct Interest	14,205,365	16,652,624	2,447,259
Balance Net Profits	$ 42,681,325	$ 42,036,899	$ 644,426*
Deduct Dividends Paid	29,460,215	30,301,705	841,490
Surplus Earnings	$ 13,221,110	$ 11,735,194	$ 1,485,916*

COMBINED BALANCE SHEETS, 1912 AND 1913.

(DUPLICATIONS EXCLUDED.)

ASSETS:	Dec. 31, 1912.	Dec. 31, 1913.	Increase.
Telephone Plant	$742,287,631	$797,159,487	$54,871,856
Supplies, Tools, etc.	23,601,262	20,083,113	3,518,149*
Receivables	37,700,623	40,349,027	2,648,404
Cash	35,729,037	31,888,858	3,840,179*
Stocks and Bonds	84,942,265	90,523,610	5,581,345
Total	$924,260,818	$980,004,095	$55,743,277
LIABILITIES:			
Capital Stock	$393,209,925	$395,224,531	$ 2,014,606
Funded Debts	294,380,353	341,147,485	46,767,132
Bills Payable	38,268,341	33,743,368	4,524,973*
Accounts Payable	25,320,335	26,471,681	1,151,346
Total Outstanding Obligations	$751,178,954	$796,587,065	$45,408,111
Employees' Benefit Fund	8,845,000	8,919,335	74,335
Surplus and Reserves	164,236,864	174,497,695	10,260,831
Total	$924,260,818	$980,004,095	$55,743,277

* Decrease.

Table No. 1. Income Account and Balance Sheet, 1912 and 1913.

of the line to the Pacific Coast in 1915, commercial communication will be dependable and practicable. The policy of investing the depreciation reserve in revenue earning plant has continued, and the public is getting the advantage of the use of a large amount of plant upon which no dividends or interest charges have to be earned.

OPERATING RESULTS FOR THE YEAR.

The accompanying table (Table No. 1) shows the business for the year of the Bell telephone system including the American Telephone & Telegraph Co. and its associated holding and operating companies in the United States, but not including connecting Independent or sub-licensee companies, nor the Western Electric Co. and Western Union Telegraph Co., except as investments in and dividends from those companies are included respectively in assets and revenue. All inter-company duplications are eliminated in making up these tables so that the figures represent the business of the system as a whole in its relations to the public.

The gross revenue in 1913 of the Bell System—not including the connected Independent companies—was $215,600,000; an increase of over $16,000,000 over last year. Of this, operation consumed $75,400,000; taxes, $11,300,000 or 1½ per cent. on the outstanding capital obligations; current maintenance, $32,500,000; and provision for depreciation, $37,700,000.

The surplus available for charges, etc., was $58,700,000, of which $16,700,000 was paid in interest and over $30,300,000 was paid in dividends.

The total capitalization, including inter-company items and duplications but excluding reacquired securities of the companies of the Bell system, is $1,390,242,470. Of this $620,127,086 is owned and in the treasury of the companies of the Bell system. The capital stock, bonds and notes payable outstanding in the hands of the public at the close of the year were $770,115,384. If to this be added the current accounts payable, $26,471,681, the total outstanding obligations of every kind were $796,587,065, as against which there were liquid assets, cash and current accounts receivable, of $72,237,885, leaving $724,349,180 as the net permanent capital obligations of the whole system outstanding in the hands of the public.

By act of Congress, approved March 1, 1913, the Interstate Commerce Commission is directed to make a valuation of all property owned or used by every common carrier under the jurisdiction of the commission, which includes all the principal telephone companies. This great work has been started and we are assisting the representatives of the commission in pushing it forward. As stated in

BELL TELEPHONE SYSTEM IN UNITED STATES.

COMPARISON OF EARNINGS AND EXPENSES, 1907 AND 1913.

(ALL DUPLICATIONS, INCLUDING INTEREST, DIVIDENDS AND OTHER PAYMENTS TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY BY ASSOCIATED HOLDING AND OPERATING COMPANIES. EXCLUDED.)

	1907.	1913.	Increase.
Gross Earnings	$128,579,800	$215,572,822	$ 86,993,022
Expenses:			
Operation	45,894,900	75,404,092	29,509,192
Current Maintenance	36,626,700	32,442,979 / 37,739,991	33,556,270
Depreciation			
Taxes	4,873,400	11,296,237	6,422,837
Total Expenses	$ 87,395,000	$156,883,299	$ 69,488,299
Net Earnings	$ 41,184,800	$ 58,689,523	$ 17,504,723
Deduct Interest	10,508,500	16,652,624	6,144,124
Balance Net Profits	$ 30,676,300	$ 42,036,899	$ 11,360,599
Deduct Dividends Paid	18,151,700	30,301,705	12,150,005
Surplus Earnings	$ 12,524,600	$ 11,735,194	$ 789,406*

COMBINED BALANCE SHEETS, 1907 AND 1913.

(DUPLICATIONS EXCLUDED.)

ASSETS:	Dec. 31, 1907.	Dec. 31, 1913.	Increase.
Contracts and Licenses	$ 9,078,000	.....	$ 9,078,000*
Telephone Plant	502,987,900	$797,159,487	294,171,587
Supplies, Tools, etc.	17,165,200	20,083,113	2,917,913
Receivables	29,584,500	40,349,027	10,764,527
Cash	24,869,600	31,888,858	7,019,258
Stocks and Bonds	29,448,300	90,523,610	61,075,310
Total	$613,133,500	$980,004,095	$366,870,595
LIABILITIES:			
Capital Stock	$291,095,400	$395,224,531	$104,129,131
Funded Debts	196,113,700	341,147,485	145,033,785
Bills Payable	45,175,700	33,743,368	11,432,332*
Total Capital Obligations	$532,384,800	$770,115,384	$237,730,584
Accounts Payable	19,436,600	26,471,681	7,035,081
Total	$551,821,400	$796,587,065	$244,765,665
Employees' Benefit Fund	.....	8,919,335	8,919,335
Surplus and Reserves	61,312,100	174,497,695	113,185,595
Total	$613,133,500	$980,004,095	$366,870,595

* Decrease.

Table No. 2. The Year 1913 Compared With 1907.

last year's report, our engineers' appraisals have shown that the cost of reproduction of the Bell properties, not including cost of intangibles, would exceed their book cost by some $61,000,000. We believe that the valuation by the Interstate Commerce Commission, when completed,

will confirm our repeated statements that the true value of our telephone plants is much greater than the book value.

These telephone plants stand on the books of the companies at $797,159,487, as of December 31, 1913, an increase during the year of $54,871,856, or 7.4 per cent., which compares with an increase of 8.2 per cent. in gross earnings. Other assets increased $871,421, making a total increase in assets of $55,743,277. This increase of $55,743,277 is represented by $45,408,111 increase in outstanding obligations for the whole system and an increase in surplus and reserves of $10,335,166.

AVERAGE OPERATING UNITS OF ASSOCIATED OPERATING COMPANIES, 1895 to 1913.

(THIS TABLE COVERS THE COMPANIES OWNING ALL THE EXCHANGES AND TOLL LINES OF THE BELL TELEPHONE SYSTEM EXCEPT THE LONG-DISTANCE LINES OF AMERICAN TELEPHONE AND TELEGRAPH CO.)

Average per Exchange Station.

EARNINGS:	1895.	1900.	1910.	1912.	1913.
Exchange Service	$ 69.75	$ 44.68	$ 31.28	$ 30.93	$ 30.45
Toll Service	11.35	12.60	9.47	9.21	9.03
Total	$ 81.10	$ 57.28	$ 40.75	$ 40.14	$ 39.48
EXPENSES:					
Operation	$ 29.15	$ 21.63	$ 15.14	$ 15.17	$ 15.92
Taxes	2.23	2.37	2.00	2.02	2.03
Total	$ 31.38	$ 24.00	$ 17.14	$ 17.19	$ 17.95
Balance	$ 49.72	$ 33.28	$ 23.61	$ 22.95	$ 21.53
Maintenance and Depreciation	$ 26.20	$ 17.68	$ 13.46	$ 13.66	$ 13.06
Net Earnings	$ 23.52	$ 15.60	$ 10.15	$ 9.29	$ 8.47
Per Cent. Operation Expense to Telephone Earnings	35.9	37.8	37.2	37.8	40.3
Per Cent. Telephone Expense to Telephone Earnings	71.0	72.8	75.1	76.9	78.6
Per Cent. Maintenance and Depreciation to Average Plant, Supplies, etc.	9.1	8.4	9.5	9.3	9.1
Per Cent. Increase Exchange Stations*	15.7	26.5	11.8	10.5	9.5
Per Cent. Increase Miles Exchange Wire*	15.9	33.2	12.0	14.3	10.9
Per Cent. Increase Miles Toll Wire*	21.3	25.2	11.5	6.2	6.6
Average Plant Cost Per Exchange Station (including Exchange and Toll Construction)	$260	$199	$142	$143	$141
Average Cost per Mile of Wire (Toll) (including Poles and Conduits)	$ 81	$ 71	$ 66	$ 71	$ 70
Per Cent. Gross Telephone Earnings to Average Plant	33.4	31.7	29.3	28.9	28.2
Per Cent. Total Net Earnings to Average Capital Obligations	9.76	8.85	7.52	7.15	6.76
Per Cent. Total Net Earnings to Plant and Other Assets	9.36	7.96	6.65	6.15	5.69
Per Cent. Paid Out on Average Capital Obligations	5.13	6.10	6.01	5.92	5.85
Per Cent. Paid Out on Plant and Other Assets	5.09	5.57	5.31	5.09	4.92

* Increase during year shown, over previous year.

Table No. 3. Detail Analysis of Operating Units.

In accordance with our previous practice in making up the combined figures for the Bell system, all inter-company items have been eliminated, and all intangible assets have been excluded, so that the combined surplus and reserves as shown on the preceding page are considerably less than the sum of surplus and reserves shown on the books of the separate companies.

All of the present surplus and reserves, aggregating over $174,000,000, is invested in tangible and productive property the revenue from which enables the companies to maintain their efficiency without paying capital charges on this amount.

Your attention is called to a comparative statement (Table No. 2) of the Bell system for the years 1907 and 1913. During that period the gross earnings have increased $87,000,000, of which $69,500,000 has been absorbed by increase in expenses, leaving an increase of $17,500,000 in net earnings. The increase in interest was $6,100,000 and in dividends $12,200,000. The surplus for 1913 was $11,700,000.

During this six-year period the assets of the companies have increased nearly $367,000,000, while the capital obligations and payables outstanding have increased less than $245,000,000. The surplus and reserves have increased from $61,300,000 to $174,500,000, over $113,000,000, after setting aside $8,919,335 for the employes' benefit fund.

AVERAGE OPERATING UNITS OF ASSOCIATED OPERATING COMPANIES.

Table No. 3 shows average operating revenue and expenses per station, operating ratios, unit plant cost, etc., of the associated operating companies (not including the American Telephone & Telegraph Company's long distance lines), for the years 1895, 1900, 1910, 1912 and 1913.

While the use of the subscriber's station as the unit of telephone statistics is open to the objection that we are using a standard which itself fluctuates, nevertheless it is the best standard or unit thus far obtainable and is therefore continued.

The changes of the past year are not large, but indicate that all the expenditures necessary to the maintenance of the property at a high standard, such as maintenance and depreciation and operation, are continued along normal lines with a slight increase.

Particular attention is called to the per cent. of net earnings and of dividend and interest disbursements to total plant and other assets:

Net earnings to plant and other assets.....5.69 per cent.
Dividends and interest to plant and other assets. 4.92 per cent.

In other words, the property employed earned less than 6 per cent. per annum, and the dividends and interest paid were less than 5 per cent. upon the value of the property, which could not be considered unreasonable.

WESTERN ELECTRIC CO.

Sales of the Western Electric Co. for 1913 amounted to $77,532,860, of which $50,681,070 represents sales to the companies of the Bell telephone system, and $26,851,790 represents sales to other customers.

REPORT OF THE AMERICAN TELEPHONE & TELEGRAPH CO.

The net earnings of the American Telephone & Telegraph Co. were $40,576,746, an increase of $2,669,101 over 1912. The interest charges were $7,656,655, and the dividends at the regular rate of 8 per cent. per annum were $27,454,037. Of the balance, $5,466,053, there was carried to reserves, $2,500,000, and to surplus, $2,966,053.

During the year $9,809,700 of stock was issued upon conversion of the 4 per cent. bonds of 1906, and in addition $900 of new stock was issued upon payment of final instalments under the offer of June 20, 1011; making the total increase of capital stock during 1913, $9,810,600.

At the close of business December 31, 1913, $145,409,000 of the $150,000,000 of convertible bonds of 1906 had been handed in for conversion, leaving outstanding at the end of the year $4,591,000, a reduction in 1913 of $12,411,000.

The total outstanding capital stock and bonds of the American Telephone & Telegraph Co. at December 31, 1913, were as follows:

Capital stock	$344,616,300
4 per cent. collateral trust bonds	78,000,000
4 per cent. convertible bonds	4,591,000
5 per cent. Western Telephone & Telegraph Co. bonds	10,000,000
4½ per cent. convertible bonds 1933	67,000,000
	$504,207,300

For the $344,616,300 capital stock, $369,136,414 has been paid into the treasury of the company: the $24,520,114 in excess of par value represents premiums. All discounts on the bond issues have been charged off. The outstanding capital obligations, therefore, represent over $24,500,000 more than their par value.

The number of shareholders, 55,983, on December 31, 1913, shows an increase of 5,686 during the year. That the distribution is general appears from the following:

49,144 held less than 100 shares each;
6,475 held from 100 to 1,000 shares each;
331 held from 1,000 to 5,000 shares each;
17 held 5,000 shares or more each (omitting brokers and holders in investment trusts, etc.).

Of the holders of less than 100 shares each,
11,595 held 5 shares or less each;
36,673 held 25 shares or less each.

The average number of shares held was 59. A majority of the company's shareholders are women. Less than 6 per cent. of the stock was at December 31st in the names of brokers.

EMPLOYES' PENSIONS, DISABILITY BENEFITS AND INSURANCE.

The plan for benefits to employes in pensions, payments during disability on account of accidents and sickness, and to dependent relatives in cases of death of employes has been in effect a year, during which period in 16,054 cases employes in this company and the associated operating companies have participated in the benefits, either directly or in cases of death through their relatives. The payments have aggregated over a million dollars. A very large percentage of cases has consisted of minor disabilities of the lower salaried employes, to whom even a short cessation of wage earning is a hardship and sometimes a calamity. In connection with the plan much is already being done in the education of the employes as to prevention of sickness. Statistics are being tabulated which will be carefully studied with a view to still further carrying on this work of prevention.

In former times, if engineering works endured for centuries, that fact counted in their favor. In these modern times it almost seems that the electrical engineer is judged by an opposite standard. It can be said that during the development period of a rapidly growing art, frequent changes in type are to be expected. From the year 1877 to the present time, improvements have followed each other with remarkable rapidity.

During the 37 years from 1877 to 1914 there were designed and constructed and installed 53 improved types and styles of telephone receiver, and 73 types and styles of transmitter. These figures do not include hundreds of minor improvements made in both transmitters and receivers.

At the beginning of 1914 there were in the Bell system, 12,000,000 telephone receivers and transmitters owned by the Bell company. Of these practically none were made prior to 1902, and of all the instruments now in service the average are less than five years old.

Efficient transmitters and receivers are essential to successful telephone transmission, but the problem of talking through long underground cables or over great distances could not be solved by increasing the loudness of the transmitter or the receiver. Failure to understand this has been the cause of loss to many who have invested in companies promoting so-called loud speaking telephones.

In the transmission of speech one mile of underground cable is often equal to 50 or 100 miles of open wire overhead, and in underground transmission a point was soon reached where no speech could be got by any transmitter.

Unless this difficulty could be minimized, further growth of the telephone was not to be expected. The annual report covering the year 1880 says:

A large amount of work has been done in the electrical and experimental department, both examining new inventions and testing telephones and apparatus and in studying the question of overhead and underground cables and the improvement of telephones and lines, both for short and long distance service. This work is expensive, but it is of the first importance to our company and must be continued.

At that early date our engineers and scientists had rightly determined that they must give attention not only to the

	Dec. 31, 1895.	Dec. 31, 1900.	Dec. 31, 1905.	Dec. 31, 1910.	Dec. 31, 1912.	Dec. 31, 1913.	Increase, 1913.
Miles of Exchange Pole Lines	25,330	30,451	67,698	120,175	143,842	151,497	7,655
Miles of Toll Pole Lines	52,873	101,087	145,535	162,702	171,161	171,554	393
Total Miles of Pole Lines	78,203	131,538	213,233	282,877	315,003	323,051	8,048
Miles of Underground Wire	184,515	705,269	2,345,742	5,992,303	7,804,528	8,817,815	1,013,287
Miles of Submarine Wire	2,028	4,203	9,373	24,636	30,301	31,833	1,532
Miles of Aerial Wire	488,872	1,252,329	3,424,803	5,625,273	6,775,984	7,261,363	485,379
Total Miles of Wire	675,415	1,961,801	5,779,918	11,642,212	14,610,813	16,111,011	1,500,198
Comprising Toll Wire	215,687	607,599	1,265,236	1,963,994	2,189,163	2,333,541	144,378
Comprising Exchange Wire	459,728	1,354,202	4,514,682	9,678,218	12,421,650	13,777,470	1,355,820
Total	675,415	1,961,801	5,779,918	11,642,212	14,610,813	16,111,011	1,500,198
Total Exchange Circuits	237,837	508,262	1,135,449	2,082,960	2,576,789	2,812,944	236,155
Number of Central Offices	1,613	2,775	4,532	4,933	5,182	5,245	63
Number of Bell Stations	281,695	800,880	2,241,367	4,030,668	4,953,447	5,415,209	461,762
Number of Bell Connected Stations*	27,807	55,031	287,348	1,852,051	2,502,627	2,717,808	215,181
Total Stations	309,502	855,911	2,528,715	5,882,719	7,456,074	8,133,017	676,943
Number of Employees	14,517	37,067	89,661	120,311	140,789	156,928	16,139
Number of Connecting Companies, Lines and Systems				17,845	24,013	25,679	1,666
Exchange Connections Daily	2,351,420	5,668,986	13,543,468	21,681,471	25,572,345	26,431,024	858,679
Toll Connections Daily	51,123	148,528	368,083	602,539	737,823	806,137	68,314

*Includes Private Line Stations.

Condensed Statistics Relating to Construction and Operation of the Bell Telephone System in the United States.

apparatus at the ends of the line, but to the line itself and to the intermediate apparatus.

By 1881 we had laid experimental underground cables for a short distance alongside of a Massachusetts railroad track with small results. In 1883 several cables were laid at Boston, the longest of which was 1,500 feet. The subscribers using this cable could not talk satisfactorily further than the suburbs.

Type after type of cable was installed only to be withdrawn in a few years and replaced by something better.

By 1887 the introduction of the twisted pair underground conductor began. This meant the abandonment of the entire underground plant of the Bell system and the introduction of the new type, without which the telephone system as we know it today would be an impossibility.

Millions of dollars were spent in this construction and reconstruction and experimental work. By 1902 the art had so far advanced by the use of the Pupin loading coils and other improvements, that a "loaded cable" for suburban service was successfully installed between New York and Newark.

By 1905 we had a "loaded cable" 20 miles long extending from New York in the direction of Philadelphia, and by 1906 a cable 90 miles long was successfully operated between those two cities, but in the then state of the art this cable could not be used beyond Philadelphia or New York.

By 1911 our experiments, researches, and improvements in manufacture had so advanced that we were enabled to design an underground cable, capable of giving a satisfactory conversation between Washington and Boston.

By 1912 a section of this new cable was laid from Washington to Philadelphia, there connecting with the earlier type of cable to New York.

During 1913 a section of the new cable was laid between New Haven and Providence, connecting at New Haven to an earlier type of cable extending to New York, and connecting at Providence to an earlier type extending to Boston.

While talking the entire distance from Boston to Washington was impossible through the old types, yet by using the underground in connection with the overhead, the seaboard cities from Washington to Boston could be no longer isolated by storms destroying the overhead wires.

During the year 1913 we have made such further advances in the art of loading and balancing underground circuits, and have so greatly improved the intermediate apparatus, that it is now possible to talk satisfactorily by underground wires from Boston to Washington, in part through types of cable formerly suitable for short haul distances only. These short haul cables make up 47 per cent. of the total cable in the line.

In 1912 talking underground for the first time between New York and Washington represented the longest distance underground yet achieved. By 1913, this distance had been doubled. The Boston-Washington telephone cable is several times longer than any other in the world.

	Year 1885.	Year 1890.	Year 1895.	Year 1900.	Year 1905.	Year 1910.	Year 1913.
Gross Earnings	$10,033,600	$16,212,100	$24,197,200	$46,385,600	$97,500,100	$165,612,881	$215,572,822
Expenses	5,124,300	9,067,600	15,488,400	30,632,400	66,189,400	114,618,473	156,883,299
Net Earnings	$4,909,300	$7,144,500	$8,708,800	$15,753,200	$31,310,700	$50,994,408	$58,689,523
Interest	27,700	278,700	655,500	2,389,600	5,836,300	11,556,864	16,652,624
Balance	$4,881,600	$6,865,800	$8,053,300	$13,363,600	$25,474,400	$39,437,544	$42,036,899
Dividends	3,107,200	4,101,300	5,066,900	7,893,500	15,817,500	25,160,786	30,301,705
Surplus Earnings	$1,774,400	$2,764,500	$2,986,400	$5,470,100	$9,656,900	$14,276,758	$11,735,194

Comparative Earnings at Five-Year Intervals of the Bell System—All Duplicates Between Companies Excluded.

	Dec. 31, 1885.	Dec. 31, 1890.	Dec. 31, 1895.	Dec. 31, 1900.	Dec. 31, 1905.	Dec. 31, 1910.	Dec. 31, 1913.
ASSETS:							
Contracts and Licenses.	$16,732,100	$18,925,700	$20,005,300	$14,794,300	$13,313,400	$2,943,381	$.....
Telephone Plant	38,618,600	58,512,400	87,858,500	180,699,800	368,065,300	610,999,964	797,159,487
Supplies, Tools, etc	348,500	1,021,800	1,810,000	6,464,400	11,069,500	20,987,551	20,083,113
Receivables	1,450,900	1,761,600	3,746,600	13,644,000	26,220,800	26,077,802	40,349,027
Cash	1,792,600	1,183,300	2,484,100	3,223,000	11,005,900	27,548,933	31,888,858
Stocks and Bonds	1,138,800	2,697,400	4,480,500	11,400,400	23,041,200	64,766,089	90,523,610
Total	$60,081,500	$84,102,200	$120,385,000	$230,225,900	$452,716,100	$753,323,720	$980,004,095
LIABILITIES:							
Capital Stock	$38,229,200	$43,792,800	$57,462,700	$130,006,900	$238,531,100	$344,645,430	$395,224,531
Funded Debts	367,400	6,473,100	10,074,100	44,137,900	93,079,500	224,791,696	341,147,485
Bills Payable	2,618,900	1,323,000	2,000,000	7,000,000	35,000,000	42,566,943	33,743,368
Accounts Payable		3,301,100	6,138,000	13,583,300	22,407,500	21,721,125	26,471,681
Total Outstanding Obligations	$41,215,500	$54,890,000	$75,674,800	$194,728,100	$389,018,100	$633,725,194	$796,587,065
Employees' Benefit Fund	.....	.....	.....	.....	.....	.....	8,919,335
Surplus and Reserves	18,866,000	29,212,200	44,710,200	35,497,800	63,698,000	119,598,526	174,497,695
Total	$60,081,500	$84,102,200	$120,385,000	$230,225,900	$452,716,100	$753,323,720	$980,004,095

Combined Balance Sheets at Five-Year Intervals, 1885-1913—All Duplicates Between Companies Excluded.

It is difficult to estimate the far-reaching importance of these researches and it is too early to forecast the benefits to be derived from them. Enough has been already ascertained, however, to show that they tend to greatly increase the long distance traffic and to accomplish enormous savings in the amounts of copper wire

	1912.	1913.
EARNINGS:		
Dividends	$24,247,430.02	$26,122,572.81
Interest and other Revenue from Associated Companies	12,523,084.45	13,564,952.47
Telephone Traffic (net)	5,472,812.66	5,548,089.00
Other Sources	474,665.62	674,377.34
Total	$42,717,992.75	$45,909,991.62
EXPENSES	4,810,348.49	5,333,245.43
NET EARNINGS	$37,907,644.26	$40,576,746.19
Deduct Interest	5,844,698.86	7,656,655.78
Balance	$32,062,945.40	$32,920,090.41
Deduct Dividends	26,015,587.76	27,454,037.15
Balance	$6,047,357.64	$5,466,053.26
Carried to Reserves	$2,800,000.00	$2,500,000.00
Carried to Surplus	3,247,357.64	2,966,053.26
	$6,047,357.64	$5,466,053.26

Comparative Statement of Earnings and Expenses, A. T. & T. Co.

which would otherwise be required to establish communication between remote points.

An exhaustive study of the New York-Denver line during the last year has shown that these improvements in transmission through unground wires are also applicable

ASSETS.		
Stocks of Associated Companies	$454,307,263.79	
Bonds of Associated Companies	581,000.00	
Capital Advances to Associated Companies	76,096,615.35	$530,984,879.14
Telephones	$14,279,677.65	
Real Estate	507,430.92	
Long-Distance Telephone Plant	49,269,173.30	64,056,281.87
Cash and Deposits		22,199,227.64
Special Demand Notes		34,311,230.41
Current Accounts Receivable		4,404,688.91
		$655,956,307.97
LIABILITIES.		
Capital Stock		$344,616,300.00
4% Collateral Trust Bonds, 1929	$78,000,000.00	
4% Convertible Bonds, 1936	4,591,000.00	
4½% Convertible Bonds, 1933	67,000,000.00	
5% Western T. & T. Co. Bonds, 1932	10,000,000.00	
5% Coupon Notes, 1907	5,000.00	
Indebtedness to Western Union Telegraph Co. for New York Telephone Co. Stock Payable 1914 to 1915	4,000,000.00	
Notes to Associated and Allied Companies	19,300,000.00	
Notes of Associated Companies Discounted	15,000,000.00	$197,896,000.00
Dividend Payable January 15, 1914	$6,892,326.00	
Interest and Taxes Accrued, but not due	3,091,570.99	
Current Accounts Payable	932,297.85	10,916,194.84
Employees' Benefit Fund		2,035,652.99
Reserve for Depreciation and Contingencies	$36,836,187.51	
Surplus	63,655,972.63	$100,492,160.14
		$655,956,307.97

Balance Sheet of A. T. & T. Co., December 31, 1913.

to overhead lines. Plans are now making for the rearrangement of the New York-Denver circuit. When accomplished, the telephone transmission between New York and Denver will be equal to that now given between points about 200 miles apart and will insure satisfactory talk from the Atlantic to the Pacific and in due course of time bring all points in the United States within speaking distance of each other.

In every other department of telephone development, the work of the general engineering staff has been continuous and equally fruitful.

During the period of 25 years practically all of the switchboards have been changed several times. Millions of dollars have been spent on inventions and experimental development. We have designed, manufactured and installed all kinds of switchboards—automatic, semi-automatic and manual—and we have exhaustively studied the practical workings of every type of switchboard in use.

It has frequently been asserted that the Bell system did not employ automatic switchboards because of patents controlled by others. The Bell company owns or has rights in every United States patent and patent application which would be necessary to operate its system upon the so-called automatic plan—which is not automatic for the subscriber as the subscriber does all the manipulation in the making of a connection. As yet it has not been demon-

Year.	Net Revenue.	Dividends Paid.	Added to Reserves.	Added to Surplus.
1900	$5,486,058	$4,078,601	$937,258	$470,198
1901	7,398,286	5,050,024	1,377,651	970,611
1902	7,835,272	6,584,404	522,247	728,622
1903	10,564,665	8,619,151	728,140	1,217,374
1904	11,275,702	9,799,117	586,149	890,435
1905	13,034,038	9,866,355	1,743,295	1,424,388
1906	12,970,937	10,195,233	1,773,737	1,001,967
1907	16,269,388	10,943,644	3,500,000	1,825,744
1908	18,121,707	12,459,156	3,000,000	2,662,551
1909	23,095,389	17,036,276	3,000,000	3,059,113
1910	26,855,893	20,776,822	3,000,000	3,079,071
1911	27,733,265	22,169,450	2,800,000	2,763,815
1912	32,062,945	26,015,588	2,800,000	3,247,357
1913	32,920,090	27,454,037	2,500,000	2,966,053

Annual Earnings and Dividends of A. T. & T. Co.

strated that the automatic system would give as good and dependable service as we now render to the public, when used in connection with the extensive and comprehensive suburban and interurban telephone system of the Bell.

At the beginning of the telephone industry there was no art of electrical engineering, nor was there any school or university conferring the degree of electrical engineer. Notwithstanding this, the general engineering staff was soon organized, calling to their aid some of the most distinguished professors of science in our universities.

As problems became more formidable and increased in number and complexity, the engineering and scientific staff was increased in size and in its specialization, so that we now have working at headquarters on the problems of the associated companies 550 engineers and scientists, carefully selected with due regard to the practical as well as the scientific nature of the problems encountered. Among them are former professors and instructors of our universities, post graduate students and other graduates holding various engineering and scientific degrees from 70 different scientific schools and universities, 60 American and 10 foreign institutions of learning being represented. No other telephone company, no government telephone administration in the world, has a staff and scientific equipment such as this.

It can be said that this company has created the entire art of telephony and that almost without exception none of the important contributions to the art have been made by any government telephone administration or by any other telephone company either in this country or abroad.

(To be continued.)

Meeting Dates of Missouri Telephone Association.

The Missouri Telephone Association will hold its annual convention at Kansas City, Mo., on May 6 and 7.

The Rejuvenation of the Craneville Telephone Exchange

A Serial Story Telling How a Rundown Telephone Plant Was Rebuilt, Enlarged and Changed Successively from a Grounded to a Local Battery Metallic System and Later to Common Battery —Problems Encountered by Every Practical Telephone Man

By Paul Hamilton

"Well, Frank," said Mr. Barrows one day just before noon, "about tomorrow morning you can lay aside your heavy tools and start out adjusting bells. The new ringing machine, or generator, will be ready to put into service. I will get Kittie to come in early, so Nellie can test with you. It is going to be a rather particular job, but I think the three of you can clean it up in a day or two. You might all come in about three o'clock this afternoon and each go through the operation of adjusting a bell in the shop.

"As we are only going to use the machine during the day, you will have to make a test with the hand generator as well. I don't anticipate much trouble, as the Doctor will understand how to use the hand generator on the evening and night calls."

"Tell me something about these machines," Frank requested.

"All right," assented Mr. Barrows. "This one is the motor. There is little for us to be concerned about, except to see that the oil boxes are full and that the rings are turning on the shaft. Some people get the impression that an encased machine with ring-oiled bearings doesn't need looking after. It is a fact that they do not require much, but I have always made it a practice in walking past such machines, if they were in my care, to feel of the bearings. At least once a day I look into the bearings and see that the rings are turning."

"How do those rings oil the bearings?" asked Frank.

"Like this. (Fig. 70.) You see, the ring hangs on the shaft with the lower side dipping into the oil. As the shaft revolves, the ring is carried over also, and as it passes over the shaft, the oil drips from it and spreads along the shaft into the bearings. Occasionally the rings stick to the bearing. This happens generally when the machine is standing; that is, when it is started the rings do not start. It is well to always look and see that they are all working properly after starting the machine."

"What is this screw for?" questioned Frank, pointing to a screw under the oil cup.

"For draining the oil cup. Once a month, at least, that screw, which is really a threaded plug, should be removed

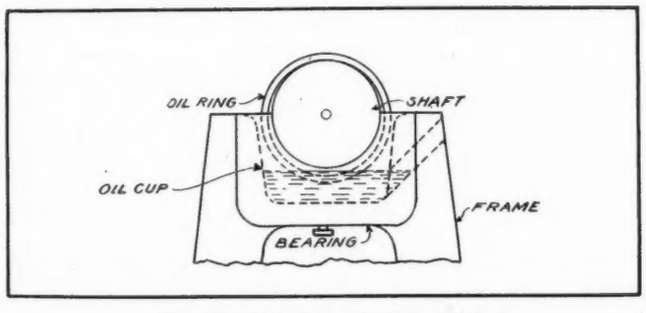


Fig. 70. Principle of Ring Oiler.

and the old oil drawn off. If there are any signs of grit or sediment in the cup it should be flushed with gasoline. After that, replace the plug and re-fill with fresh oil."

"If I find a bearing too hot, what then?"

"First see if the ring is moving and is dipping into the oil. If that is not the cause, stop the machine and clean the oil cup. If it still runs hot, we will have to remove the upper bearings in an effort to locate the trouble."

"All right, I see. I guess I'll be going."

Frank went out through Mr. Rankin's office and Mr. Rankin, observing this, went into the exchange.

"Well, Barrows, the farmers on the north side are hang-

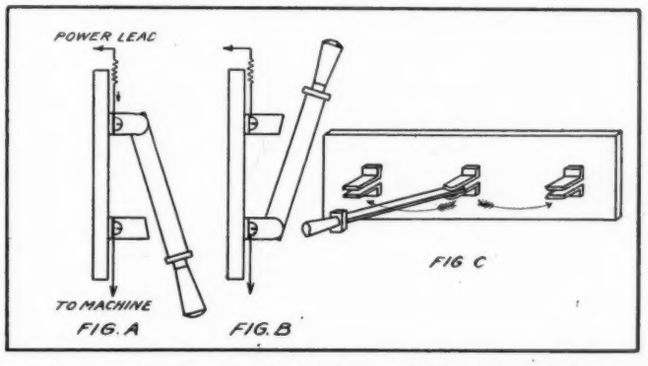


Fig. 71. Wrong and Right Ways of Mounting Switches.

ing fire a little, but it isn't on account of Runkel's crowd. They figure eight dollars is a pretty stiff rate. Maybe if I knew something about how you arrive at that figure, I could convince some of them. Of course, you understand, I don't want to know your private affairs, but I do want to see that Runkel crowd come to time, and if there's anything in the game for you, I'd like to see you get it."

"I'll tell you the facts in the case, Mr. Rankin. This outside business really comes within my province. It is a mistaken idea that there is big money in it. Figure it this way. Make the investment $500; a total replacement in 12 years, allowing 8 per cent. on your investment and you'll find your trouble trips have got to be few and far between.

"The trouble is that they figure on building a line like Runkel's, which really isn't a telephone line at all. As a separate proposition, you can't figure to break even. It wouldn't be worth bothering with. Putting it in with Craneville, it will figure a little better because I have certain fixed expenses which will not be increased by this addition."

"They'll be around to see me. I'll see what I can do with them. I should think they'd jump at the chance. It strikes me that they must get busy or put in the winter as they always have. A telephone would liven things up considerably on lonesome days."

"That is one of its functions: to bring people ear to ear, if not face to face."

"Good day, Barrows, I'll see you again," and Mr. Rankin went on his way ruminating on the possibility of being elected sheriff of the county at the spring election.

That evening both Frank and Germany returned to the exchange. They found Mr. Barrows and the man sent to install the ringing machine, inspecting the various parts of the work. The installer, Mr. Barrows being satisfied with the preliminary inspection, finally put on his coat and departed.

"I didn't expect you boys down tonight," said the proprietor, "but as long as you're here, you may as well make the trip worth while. We will begin here at the power switch and follow through to the key shelf.

"This switch, as you see, is enclosed in an asbestos lined box, the door of which should be kept closed at all times. This box is what is generally called a 'cut-out box.' The lighting company owns and controls the wires to the bottom of this fuse block to which the wires from the upper posts of the switch are attached. The fuses serve two purposes:

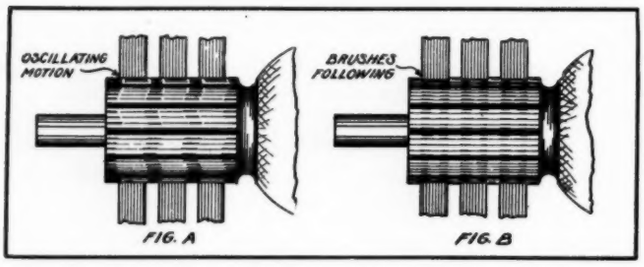


Fig. 72. Brush Wear on Commutator.

They protect our machine from a heavy current and also the company's transformer from trouble which may occur at this end.

"From the cut-off box, the wires are pulled through separate conduits that terminate under the stand. Now here at the switch, I will mention one or two little points. If you are working around the machines when they are not in service, that is, clearing trouble or overhauling them, be sure this switch is open. If you are making extensive repairs such as removing the coupling or bearings, take out the fuses.

"About handling this switch: It is furnished with an insulated handle, therefore there is no reason for touching any of the metallic parts. In opening and closing it, give a quick push or pull in order to break the contacts quickly and cleanly; otherwise the current will arc between the posts and switch blades."

"Wouldn't it be handier the other way up?" Germany asked.

"It might for a left-hander," said Frank.

"It isn't a matter of convenience. Uusually, when the switch is open, we want it to remain so until purposely closed. Suppose we reverse it. When it is open, the weight of the switch is carried on the pivots. In time the pivots will wear a little and some day the switch will fall unexpectedly. Single throw jackknife switches should, when possible, be mounted so the blades when open will fall away (Fig. 71-*B*) from the contact posts by gravity."

"Then it is always advisable to have the live side of the circuit attached to a stationary post, and not to the movable part of the switch. This can be done on any single throw switch. If we had two machines, we would work them both from one switch having double action and contacts

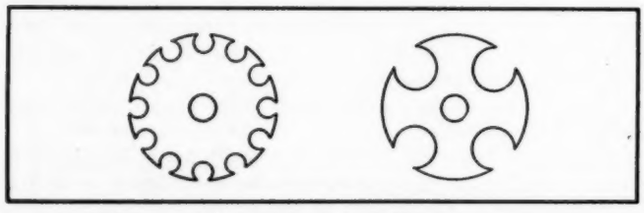


Fig. 73. Shapes of Iron Armature Core Plates.

(Fig. 71-*C*). In such cases I would mount the switch horizontally.

"Now, going back to the motor. The leads, leaving the conduits, pass through porcelain tubes set in the stand and run direct to the binding posts. That is the end of the 110-volt alternating current.

"The connection between the two machines is mechanical by means of a knuckle arrangement. One-half is locked to the motor shaft permanently, while the other is held in place by a key and set screw which are easily removed with a wrench, but quite secure against jarring loose."

"This business in between the iron plates, what is that?" Germany asked.

"That is a fibre washer inserted in the knuckle joint as a cushion. As it is, the joint is not as rigid as it would otherwise be and it eases the relation of the two machines."

"It is an insulation, isn't it?" queried Frank.

"It is, but it is not required as such between the two machines. The machines have no electrical relation. We have traced the current into the motor, but from the generator we must trace the current out. The current is picked up from these commutator segments by these carbon brushes. Each segment represents a winding on the armature. As the armature revolves, the windings cut the magnetic lines of force and current is generated. This is conducted out to these segments. The moment each winding is cutting the greatest number of lines of force, its terminals or segments come under the brushes."

"These you call brushes? Three in each row?" asked Germany. "What is the difference in them?"

"None whatever. Some machines have one wide brush, some two, and this one, you see, has three. Either one of the brushes will carry all the current required. In the case of one brush, if anything lodges between it and the commutator, the ringing efficiency is cut down, and it is possible to break the circuit entirely. With three brushes on each

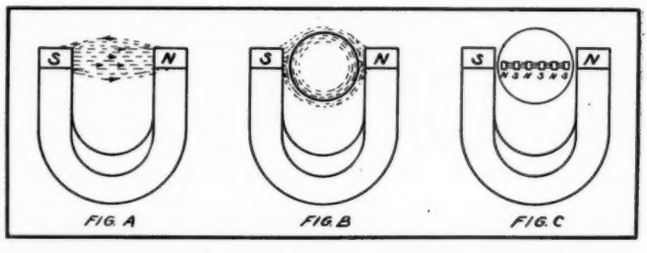


Fig. 74. Lines of Force and Atom Arrangement of Soft Iron.

side, there is hardly a chance of either full set being interrupted at one time."

"When the machine is running the armature, as you call it, runs endways, too," said Frank. "Is that all right?"

"Yes. You see if it didn't oscillate, as we call it, there would be spaces between the brushes that would not get any wear unless the brushes were shifted on the holder occasionally. In other words, each brush would cut a groove for itself in the copper segments (Fig. 72-*B*). That leaves the surface of the commutator uneven and rough. In time it will have to be dressed in a lathe. With the shaft oscillating, the wear is even (Fig. 72-*A*)."

"Do you put oil on the commutator?" Frank asked.

"No, it is not good practice, and with these brushes, it is unnecessary. The carbon contains the necessary lubricant. It is well to hold a cloth or piece of waste on the commutator, say once a week, and lift each brush for a moment. This releases any loose dirt that may have collected and the cloth picks it up.

"In some cases, the surface may become glazed, then a touch with emery cloth will help matters."

"When the armature was out of the machine, it was heavier than I thought from looking at it. What is inside?" Germany ventured.

"Well, of course, the wire weighs something and the shaft also, but the main weight is made up by the core. That is made of flat disks or washers of soft iron, forced upon the shaft one against the other. They are cut in various shapes like this (Fig. 73) to afford grooves for the various windings.

"When placed on the shaft, they form a cylinder with

grooved sides. Each washer forms a magnetic field of its own, making a greater combined efficiency than that of a solid iron core.

"Another point concerning the use of iron is the peculiarity that its atoms readily arrange themselves to permit magnetism. What we desire in a generator is that the windings

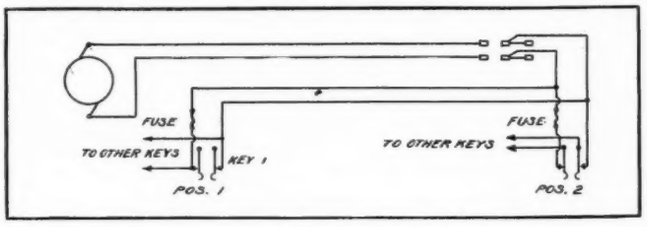


Fig. 75. Circuit of Ringing Machine to Board.

of the armature shall cut as many magnetic lines of force extending between the poles of the machine, as possible, and at right angles, like this (Fig. 74-*A*). Suppose, for instance, the core were made of steel. The atoms arrange themselves so slowly that the line of force would not find a direct path across from pole to pole (Fig. 74-*B*), but would be deflected and many of them would be absorbed by the core itself.

"With the soft iron core, we have an arrangement of atoms between the poles like this (Fig. 74-*C*). No matter how fast the core revolves, the atoms rearrange themselves, always forming a bridge for the magnetic lines of force. There is one mechanical advantage to a heavy armature: It requires no balance wheel, as its weight steadies its own motion.

"Now we will follow the leads from the brushes to the board. The circuit is all wired temporarily, as you see, and will not be made permanent until the new board is installed. Here is the circuit. (Fig. 75). A supply of fuses will be kept handy on the board."

"There is a man here to see you, Mr. Barrows," said the Doctor, returning from the door.

Upon this announcement the consideration of the generator was discontinued.

(*To be continued.*)

National Presents Advantages of Its Washington Office.

The National Independent Telephone Association has sent out letters giving reasons why Independent companies should become members of the organization. The letters, which are signed by Secretary MacKinnon, read as follows:

As has been announced through the telephone journals, the National Independent Telephone Association has opened an office in Washington, D. C., at 527 Colorado Building.

The decision to establish this office and to have the secretary of the association devote his time to the representation of members of the association before the national regulating departments was reached only after careful investigation of various conditions now existing and after deliberate consideration of the needs of all classes of telephone companies.

The control given the Interstate Commerce Commission over practically every telephone company in the United States is set forth in the enclosed circular. Inasmuch as the telephone business is of a decidedly technical character, the commission has been slow to initiate any regulation, but the commission has been for several months, and is now, conducting a careful and searching investigation of the business. It is expected that when this investigation is concluded, the commission will more actively take up the regulation of interstate telephone business.

Your company comes within the jurisdiction of the commission. As a member of this association your every interest will be guarded and the secretary of the association will give you prompt notice of all rulings and hearings of the commission.

Heretofore the Independent companies have had no one with a knowledge of the telephone business stationed in Washington to represent their interest. The larger companies have employed attorneys to act as their agents in accepting notices of rulings and hearings, but the number who have done so is small compared with the thousands of companies which have been unrepresented.

This representation at Washington is now offered by the association to every company becoming a member, without extra charge above the annual membership fee of $10, to companies having over 500 subscribers; or $5 to those companies having less than 500 subscribers. No company can afford not to be a member.

Under the "Sherman Act" the proceedings were instituted by the attorney general that resulted in the now famous American Telephone & Telegraph Co. agreement, with its resultant problems as to connections between the Independent and Bell telephone companies. This agreement, for which the attorney general and his assistants deserve the credit, has brought to the notice of all telephone companies the danger every one of them is in of unintentionally violating the "Act." The questions of the legality of consolidations of Independent exchanges; of the purchase of Bell plants by Independents; of the consolidation of toll lines—all these questions must be given attention. The enforcement of the anti-monopoly laws rests with the attorney general—the Department of Justice. The National association is undertaking to place before this department the problems of every member. Is not membership in this association well worth while for this reason alone?

If, then, you want:

Representation before the Interstate Commerce Commission;

Representation before the Department of Justice;

To be kept in touch with all important legislative matters affecting telephone interests; and

To aid in upbuilding the great telephone industry, you can get what you want by joining the National Telephone Association.

A membership blank is enclosed. Make all checks, drafts or money orders payable to the association. When you send in your membership application, fill out and sign the "Declaration of Agent" form. When you write, express your views freely. The details of every man's situation are needed and desired.

May we not hear from you at once?

National Independent Telephone Association,
By F. B. MacKinnon, Secretary.

Accompanying each letter is a blank form which when filled out authorizes the association to act as a company's agent in connection with matters before the Interstate Commerce Commission. An application blank for membership in the association is also enclosed with the letter.

A circular giving the parts of the Interstate Commerce Commission Act that relate to telephone companies has been issued by the association and accompanies the letter. The sections of the act which relate to telephone companies are as follows:

Section 1 of the act to regulate commerce provides:

That the provisions of this act shall apply to * * * telegraph, telephone and cable companies (whether wire or wireless) engaged in sending messages from one state, territory or district of the United States, or to any foreign country, who shall be considered and held to be common carriers within the meaning and purpose of this act * * *.

Ruling No. 305 of the Interstate Commerce Commission says:

Each and every telegraph and telephone company which transmits messages over its line or lines from a point in one state, territory or district of the United States to any other state, territory or district of the United States, or to any foreign country, is subject to the provisions of the act.

If two or more lines are connected so that a person within one state, territory or district of the United States, talks with a person at a point without such state, territory or district of the United States, or so that a message is transmitted directly from a point within a state, territory or district of the United States to a point without the same, the transmission of messages in this manner constitutes interstate commerce and brings all of the participating lines within the purview of the act.

Section 6, Public No. 218, provides:

It shall be the duty of every common carrier subject to the provisions of this act, within 60 days after the taking

effect of this act, to designate in writing an agent in the city of Washington, District of Columbia, upon whom service of all notices and processes may be made for and on behalf of said common carrier in any proceeding or suit pending before the Interstate Commerce Commission or before said Commerce Court, and to file such designation in the office of the secretary of the Interstate Commerce Commission, which designation may be changed by like writing similarly filed; and thereupon service of all notices and processes may be made upon such common carrier by leaving a copy thereof with such designated agent at his office or usual place of residence in the city of Washington, with like effect as if made personally upon such carrier, and in default of such designation of such agent, service of any notice or other process in any proceeding before said Interstate Commerce Commission or Commerce Court may be made by posting such notice or process in the office of the secretary of the Interstate Commerce Commission.

Convention of Iowa Independent Telephone Association

Eighteenth Annual Gathering Held at Des Moines, Iowa, on March 17, 18 and 19, was Well Attended—Increased Efficiency in Handling Traffic is Prominent Feature—School for Operators Conducted by W. S. Vivian—Election of Officers

The eighteenth annual convention of the Iowa Independent Telephone Association was opened at the Chamberlain Hotel, Des Moines, Iowa, on Tuesday afternoon, March 17, the registration being about 100. The first session of the convention was open with an address by President H. L. Beyer, of Grinnell, Iowa. Mr. Beyer devoted himself largely to consideration of the economical handling of traffic and the increasing of efficiency on the part of operators. The watchword of the Independent companies, he said, should be service. He said he was in favor of having a traveling expert operator in the field to aid in instructing operators in handling traffic.

C. C. Deering.

H. L. Beyer.

J. M. Plaister.

During the afternoon W. S. Vivian, secretary of the Independent Telephone Association of America, conducted an operator's school, addressing nearly 50 chief operators at two sessions.

Wednesday and Thursday Sessions.

At the Wednesday morning session G. W. Pratt, general superintendent of the Iowa Telephone Co., of Omaha, was the first speaker. He opposed the government ownership of telephones and declared it to be a flat failure in Europe. C. B. Randall, of St. Paul, Minn., delivered an address on "Independent Telephony." J. W. Coffey, of the Coffey System & Audit Co., Indianapolis, delivered a talk on the subject of accounting. L. W. Grimes, of Des Moines, Iowa, spoke on the subject "Publicity," declaring that if telephone companies informed the public as to some of the problems with which they have to contend, the public will understand them better and be more patient. He recommended that telephone managers take the public into their confidence both as to improvements in service and in efforts made to continually maintain good service.

G. E. Bickley, of Waterloo, was down on the program for a paper on "Interference of Transmission Lines," dealing with the subject from the engineering standpoint. In the absence of Mr. Bickley, this paper was read by H. H. Carl, of Waterloo. The same subject was dealt with from the legal point of view by H. L. Beyer, of Grinnell, Iowa. E. C. Hurd, a member of the consulting staff of the Nebraska Railway Commission, delivered an interesting talk upon the subject of appraisals and valuations.

Included in the program was a paper on the "Workmen's Compensation Law" by Warren Garst, Iowa Industrial Commissioner; and one on "Underground Construction for Small Plants," by L. W. Stanton, of Davenport, Iowa.

The entertainment provided for attendants at the convention included a banquet on Wednesday evening, followed by a party at the Orpheum, where special telephone motion pictures were shown.

H. L. Beyer, of Grinnell, was re-elected president of the association and C. C. Deering, of Des Moines, was chosen as secretary-treasurer for a second term. The executive board for the coming year includes George Atkinson, of Creston; H. A. Kinney, of Woodbine; H. B. Shoemaker, of Toledo, and J. M. Plaister, of Ft. Dodge.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities and Actions of City Councils Bearing Upon Franchises, Rates and Service

Harlan Chairman of Interstate Commerce Commission.

James S. Harlan has been elected chairman of the Interstate Commerce Commission, succeeding Commissioner Edgar E. Clark. Commissioner Harlan's selection is in accordance with a policy adopted several years ago that the term of chairman of the commission should last one year and the senior commissioner should be elected for the post.

Three Commissions to Hold Joint Meeting.

The public service commissions of the states of Pennsylvania, Ohio and West Virginia are to hold a joint meeting this month in order to adopt a uniform system of reports and accounting. The Ohio and Pennsylvania commissions are said to be in practical agreement already on the forms of reports to be required and the West Virginia commission will no doubt adopt the same forms.

Physical Connection Hearing in Canada.

There has been an application before the Dominion Railway Commission of Canada for a long distance arrangement, a standard form of agreement, fixing the extra charges that shall be made for connection; evidence was taken, and the case was argued. The board made an order on non-competing companies, but has never made an order compelling competing companies to give connection. The point has been raised now very definitely by G. W. Jones, manager of a company operating at Port Hope, Newcastle, Netwtonville and Bowmanville. The Bell company has no telephones in Newtonville or in Clarke township, but Mr. Jones' company is competing with the Bell in Port Hope. The point is, will the competative condition be recognized in one part of the system and not in another.

Commissioner Scott suggested that an application be made to the Ontario Railway & Municipal Board on the question of local companies. In the meantime the Dominion Railway Commission has asked the Bell Telephone Co. to forward a copy of its contract with Mr. Coulson, who is operating a private system, to find out whether this is a competing line. At the hearing Dr. Alexander, of Bowmanville, and Dr. Hillier, Mayor of Bowmanville spoke of their hardships through lack of connection with Independent systems, and Deputy Reeve Edwards, of Hope township, also urged the need of connection.

Independents To Hold Uxbrige & Scott Co., of Canada.

For the purchase of the Uxbridge & Scott system, a part of the York & Ontario Independent Telephone Union, $10,250 has been paid in to the Ontario Railway and Municipal Board by the Home Telephone Co. The Bell Telephone Co., of Canada, undertook to purchase the Uxbridge & Scott System, but this would have broken up the Union, which comprises seven companies. Although the sale had practically been made, the Union took the matter before the Municipal & Railway Board, which gave the Independent companies 90 days in which to make some kind of arrangement with the Uxbridge & Scott people to hold the territory for the Independents, if possible. That time has now expired, and the result of the negotiations has been that the Home Telephone Co., one of the Independents in this Union, has paid in the purchase price offered by the Bell company. The Board will turn it directly over to the vendors.

Formal Rate Complaint Against Glen Telephone Co.

Formal complaints in regard to the rates charged by the Glen Telephone Co., of Gloversville and Johnstown, Fulton county, New York, have been filed with the New York Public Service Commission by Nathan D. Griffin, individually and as president of the Merchants' Association, of Gloversville. The complaint recites the incorporation of the company, the rates charged for service from 1900 to 1905 when an advance was made, the economic conditions between Johnstown and Gloversville, and the telephone company's alleged over-capitalization, and excessive charges of service. The petitioner asks the commission to require the telephone company to cease charging toll for messages between Gloversville and Johnstown, to reduce the price for extension telephones, business and house telephones, and telephone service generally. Mr. Griffin asks that the charge for telephone service be fixed by the commission at a fair and equitable rate.

New York Legislature Passes Bill for 5-Cent Rate.

By a vote of 107 to 16 the Assembly of New York state last week passed a bill to establish a uniform five-cent telephone rate for telephone calls in New York City. The Assembly had voted 66 to 64 to lay over consideration of the telephone question, including the governor's message for $100,000 to make the appraisal of the property of the New York Telephone Co., for special order on March 23, and the bill was generally understood to be on the shelf for the time.

Assemblyman Mark Goldberg, of New York, who has been fighting through the session for the telephone bill, persuaded Assemblyman Emden to move to reconsider, and the motion, made nearly two hours after the question had been laid aside, threw the chamber into an uproar. There were violent protests. Mr. Goldberg took the lead for the bill and gave notice that any Assemblyman from New York who voted again to sidetrack the measure would be committing political suicide. Mr. Goldberg insisted on a slow roll call so that every assemblyman would have to go on record. The motion to reconsider was adopted by 71 to 66. Mr. Goldberg then moved the five-cent bill.

"There has been a delay of two years while the Public Service Commission has been trying to decide whether the state or the company should pay to appraise the property," Mr. Goldberg said. "Let the company do its own appraising. Why should the legislature pay for it? In the meantime the telephone company is maintaining unfair rates, in some cases almost extortionate, and the people appear to have no redress."

The vote for the bill included democrats, republicans and progressives. The measure now passes to the Senate.

The Foley committee named to investigate the telephone situation in New York had submitted a preliminary report to the legislature. The committee suggested a public rate of five cents or less in New York City, the passage of bills to prohibit the transfer of physical properties between telephone companies without the consent of the New York Public Service Commission, and giving the commission power to prevent rate advances when companies are consolidated.

Valuation Question in Ohio Rate Hearing.

The Ohio Public Utilities Commission has received a complaint from N. G. Warth and other citizens of Gallipolis, Ohio, against the Gallia Telephone Co. It is alleged in the complaint that the company bases its rates on a valuation of $108,000. The value fixed by the state tax commission is said to be $55,000, while the complainants contend that the physical valuation of the plant, on which they declare the rates should be computed, is less than $35,000.

The gross rates now charged by the telephone company are $45 a year for a single business telephone, $21 for a single residence line and $18 for a residence party line. It is alleged that rates of $30, $15 and $12 for the same service will yield sufficient return to the company on its investment. These rates are asked by the complainants.

The telephone company is capitalized at $50,000 common and $75,000 6 per cent. preferred stock. The complainants say that the preferred stock is unnecessary and requires a toll of $10 a telephone to provide for dividends on this stock. Bad service also is complained of. It is alleged that the company has not issued a new directory for the city of Gallipolis since 1911.

Ohio Companies Must Make Itemized Property Valuation.

The Ohio Public Utilities Commission has issued a general order requiring all public utilities in the state, over which the commission has jurisdiction, excepting steam railroads, telegraph and sleeping car companies, to report itemized valuations of their properties to the commission before August 1, 1914. Uniform methods of making the valuations are prescribed in the order. This is the first general order of this kind which has been issued by the commission.

Physical property is to be listed in three ways: Cost of reproduction, depreciation and net value. Among other classes in the estimates are: Value claimed for overhead expense during the time of theoretical construction, value of franchises or contracts, "good will," "going value," financing and property owned but not used by the utility.

Wisconsin Physical Connection Case.

Attorney General W. C. Owen, of Wisconsin, has notified Frank Winter, of La Crosse, that he is preparing to force to trial at this term of the circuit court of Dane county the physical connection case in which Mr. Winter is interested. This case will come before the court at Madison on an appeal by the Wisconsin Telephone Co. from the decision of the Wisconsin Railroad Commission ordering the enforcement of the physical connection law in furnishing service to subscribers of the La Crosse Telephone Co. over toll lines operating out of La Crosse.

In its appeal from the commission's order, the Wisconsin Telephone Co. attacked the constitutionality of the physical connection law, claiming it abrogates fundamental rights vested in all corporations and individuals, and is, in reality, confiscatory in nature.

Involved in the case is a question of rates. The Wisconsin Telephone Co. demands a far greater share of the toll charges on business which it is to handle for subscribers of the La Crosse company, if the law is to be upheld by the courts, than is deemed reasonable by Mr. Winter and officers of the La Crosse company, as well as those of other Independent lines.

Co-incident with the notification of appeal to the circuit court by the Wisconsin company, Mr. Winter demanded physical connection of city telephone lines in La Crosse, as well as connections over competing toll lines. The ruling of the circuit court in Dane county is expected to determine the constitutionality of both the rural and urban physical connections and all points at issue in the act.

Mr. Winter has for months been preparing for this trial, and will be fortified by depositions from various Independent telephone company officials in the state, on the question of apportioning rates.

Wisconsin Supreme Court Hears Anti-Duplication Case.

Arguments were made before the Wisconsin Supreme Court last week on the question whether the Citizens' Telephone Co., of Eau Claire, maintained sufficient local service to justify the state in permitting it to issue stock for extensions. The field is already occupied by the Wisconsin Telephone Co., and under the anti-duplication law the Citizens' company must prove the necessity of its service. It gives long distance service to neighboring communities, but its local service in Eau Claire consisted, according to testimony, only of 28 subscribers, 36 telephones, and five pay stations, and it issued a Eau Claire directory.

The railroad commission denied the company's application for authority to issue stock upon the ground that the company had no lawful right to do a local business. Judge E. Ray Stevens, of the Dane county circuit court, set aside this order, and the railroad commission took this appeal to the supreme court. The state's counsel argued that the subscribers became such in order to obtain long distance service, and that local service was only an incident to a principal service not local. Attorneys for the company maintained that the company was given authority by the city to use the streets and alleys for poles and wires, and otherwise had been recognized as having in view a local business, and that the fact a local business was actually done and compensated for by subscribers was evidence of the good faith and purpose of the company in Eau Claire.

Rates for Small Village and Rural Service in Wisconsin.

The Wisconsin Railroad Commission has issued an order permitting the Troy & Honey Creek Telephone Co., of Prairie du Sac to increase its rates slightly. The new rates, which are believed to be the commission's idea of fair rates for small village and rural service, are as follows: For rural business places, straight ringing, $15 a year; business places, silent telephones, $16; residence, straight ringing, $13.50; residence, silent telephones, $14.50. For village business places, one party, straight ringing, $17 a year; business place, one party, automophone, $18; business place, two-party, straight ringing, $14; business place, two-party, harmonic, $15; residence, one party, straight ringing, $15; residence, one party, automophone, $16; residence, two party, straight ringing, $13; residence, two-party, harmonic, $14; residence, four-party, straight ringing, $12; residence, four-party, harmonic, $13.

Telephone Situation at Monticello, Ind.

The telephone situation at Monticello, Ind., is still at opposites as between the citizens and the Monticello Telephone Company. The citzens demanded free service to Yeoman and Idaville and to Buffalo when service is established there, no advance payments, and the submission of rate differences to the Indiana Public Service Commission. The company agreed to free service to Buffalo, but not to all the other points, and asked advance payments on new installations. This proposition by the company has been rejected by the people of Monticello.

Municipal Automatic System Proposed for Anderson, Ind.

The citizens telephone committee of Anderson, Ind., where a municipal telephone plant is under consideration, has been investigating the automatic system at Rushville with a view of the adoption of a similar system in Anderson.

Vermont Commission Renders Its Decision.

The Vermont Public Service Commission has issued its order and report in the cases of the telephone companies, making a special order in the case of each class of companies. In the cases of the New England, the Franklin, the Champlain, and the Vermont companies a reduction of rates is ordered of $3 on six party business lines and farmers' lines. The commission recommends that the companies establish four-party residence service at the existing six-party rate. The toll rates are held to be reasonable and are not to be disturbed.

The valuation fixed by the commission is considerably lower than that of State Tax Commissioner Plumley, the difference in the case of the principal companies, except in the case of the Passumpsic company, being as follows:

New England Telephone & Telegraph Co., value assessed by the tax commissioner, $2,025,000; valuation by the public service commission, $1,569,105.

Champlain Valley Telephone Co., value assessed by tax commissioner, $100,000; by the public service commission, $92,244.

Franklin County Telephone Co., value assessed by tax commissioner, $110,000; by public service commission, $72,101.

Vermont company, value assessed by tax commissioner, $270,000; by public service commission, $239,770.

Passumpsic Telephone Co., value fixed by tax commissioner, $420,000; by the public service commission, $435,391.

The commission finds that the New England's subsidiary companies, with the possible exception of the Vermont company, "were organized for the purpose of suppressing competition, and large sums were used by these companies in the purchase of plants at high valuations, and some of these plants when acquired were scrapped. The New England company has been active in the suppression of competition and in financing the subsidiary companies for that purpose."

The order says that "in view of the fact that these companies have a virtual monopoly of the telephone business within their respective territories, we have determined that they are entitled to earn six per cent. in the value of their respective plants and upon their other assets used in the business. This order does not apply to the Passumpsic company because it is claimed the company was inadvisedly given the right to increase its rates and finance, by a public service commission, so that the state has no right to order a change."

Commissioner Warner, who was a member of the previous commission, files a minority report, taking exception to many of the holdings of the majority. The New England company announces that an appeal will be taken to the supreme court of Vermont. In a statement issued by Vice-president E. K. Hall, the attitude of the Bell company is set forth as follows:

Never before in the history of the New England Telephone & Telegraph Co. has it taken any appeal from any order or any recommendation by any commission, either state or federal. Circumstances surrounding the present case, however, are peculiar and the finding is one which the company is unable to understand, in view of the fact and the evidence presented to the commission.

In justice to the telephone using public in the state of Vermont and the other states, where the company operates, as well as in justice to the company itself, the officers of the company feel that it is their duty to appeal from the decision of the majority of the commission in this case, and wish to state frankly why such an action seems to be the only course fairly open to them.

The net revenue of the New England company on its Vermont business at the present time represents less than a two per cent. return on the value of the property located in Vermont. The reductions proposed by the majority of the commission would practically wipe out all of this net revenue.

Although the commission admits in its opinion that the company is entitled to earn at least six per cent. it undertakes to establish, by the order of the majority, a set of rates under which it would be impossible to earn even one per cent. provided the company continued to maintain its plant and the quality of its service.

The majority opinion seeks to justify these apparent contradictory conclusions by arbitrarily reducing the value of the company's property as shown by the uncontradicted evidence in the case, to a figure far below its actual cost and far below what it would cost to replace it in its present condition. It then proceeds to arbitrarily reduce, on paper, various actual costs of maintaining the plant and furnishing the service, by making various assumptions as to values and costs, which are not only not based on any evidence presented at the hearing, but which are distinctly contrary to the uncontradicted evidence in the case.

The majority of the commission then present a compilation of figures based on these various assumptions which, they argue, justifies the reductions suggested, and which, they argue, shows how the company might get a six per cent. return on this theoretical investment. By carrying these assumptions still further and by arbitrarily, on paper, reducing the value of the company's property by 50 per cent. instead of by 25 per cent., it would obviously be possible to justify, on paper, a still more liberal reduction in the rates.

Unfortunately for the company, however, upon whom rests the actual responsibility of furnishing the service, these assumptions do not help very much in the actual conduct of the business. If an article costs a dollar it costs a dollar and its value is not changed by an arbitrarv assumption, on paper, that it costs 50 cents, and the fact remains that if the rate schedule as proposed by the majority of the commission had been in effect during the year ending June 30, 1913, the company would have been left without any margin of profit whatever over and above the expense of furnishing service in the state of Vermont.

Summary of State Commission Hearings and Rulings.

INDIANA.

March: Petition by the Northwestern Indiana Telephone Co., of Chesterton, Ind., asking authority for the recall of the present preferred stock and a new issue of $100,000 to take care of a rapidly growing system.

KANSAS.

March 31: Hearing as to the efficiency and sufficiency of the telephone facilities and services at Ottawa, Kan., of the Kansas City Long Distance Telephone Co.

NEW YORK.

March 21: Formal complaint filed by Nathan D. Griffin, individually and as president of the Merchants' Association of Gloversville, regarding the rates of the Glen Telephone Co. of Gloversville and Johnstown.

OHIO.

March 17: Order requiring telephone and various other public utility companies to report itemized valuations of their properties to the commission before August 1, 1914.

OHIO.

March 19: Complaint filed by N. G. Warth and citizens of Gallipolis regarding the rates of the Gallia Telephone Co.

March 19: Cincinnati & Suburban Telephone Co. asked authority to issue 12,743 shares of stock at a total par value of $637,150, the proceeds to be used to complete the new telephone building, Cincinnati, to install the switchboard and further extend the underground cable system.

OHIO.

March 23: Modification of order rendered on February 11 in the matter of the issuance and sale of stock and bonds of the Brewster Telephone Co., of Brewster, Ohio. The company is authorized to issue $600 of common stock and $4,500 of six per cent. bonds. The proceeds are to be used to pay outstanding short term capital obligations and for additions, extensions and improvements.

OKLAHOMA.

April 15: Hearing for receiving objections to the proposed adoption by the Corporation Commission of Oklahoma of the uniform system of accounts for telephone companies prescribed by the Interstate Commerce Commission, and instructions relative to operating expense accounts.

WISCONSIN.

March 17: In a proceeding under the anti-duplication law, the Freedom Mutual Telephone Co., of Freedom, Wis., has been allowed by the Wisconsin Railroad Commission to extend its lines in the towns of Freedom and Onedia.

March 20: Order authorizing the Troy & Honey Creek Telephone Co., operating in the western part of Dane county, to make a readjustment of its rates. The commission also specified that the company must make complete trouble reports and maintain a set of books satisfactory to the commission before the new rates may be applied.

March 20: Order authorizing the Augusta Light & Telephone Co. to issue $3,140 in bonds for general improvements.

Queries on Theory and Practice

Placing the Wires Underground.

We are thinking of putting in some cable in the near future, and are considering placing it underground, not in conduit, but covering either with concrete or boards before filling in the dirt. Our lines cross a railroad and we intend putting all the lines in cable. Our system is grounded magneto, but we plan to run everything metallic through the cable. We have some short metallic toll lines and also one No. 10 copper long distance line. The only thing we are afraid of is lightning. The cable will be about 1,400 feet long. What size do you advise? Is No. 22-gage large enough? And what do you think of the proposition? We have no high tension lines to bother with. Any information or advice will be appreciated.

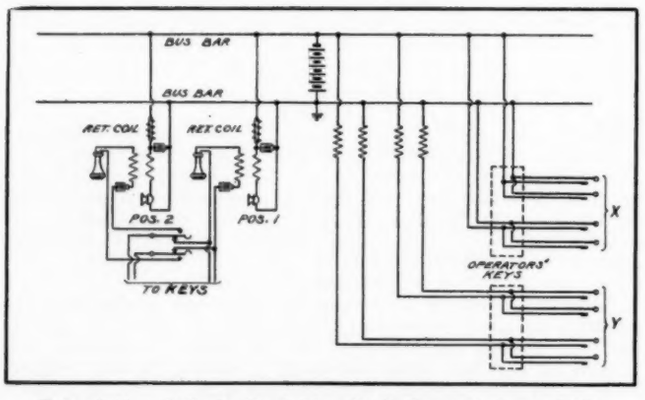
The simple burial of telephone cables without conduit is still in process of development, so that we cannot advise you with finality. A few things, however, are certain. Do not use too small a cable. Your growth may exceed your expectations, so install plenty of pairs.

It is advisable not to cover with boards. Cases have occurred in which the lead sheath has been attacked under planks and not under concrete, hence we advise covering with concrete. Dig your trench deep enough to avoid disturbance from workmen on waterpipes, railroad track, etc. Let the cable touch nothing but earth and concrete. Before laying, measure the insulation and conductor resistance of each pair. Repeat after laying and file the information for use if trouble develops; also record the exact length of cable. Protect with good lightning arresters, for it will pay far better to make a trip to clear arresters than to let lightning in to damage the cable.

For the short length of cable, 1,400 feet, No. 22 gage will be large enough, as the transmission on the local lines and the short toll lines will not be affected to an appreciable extent. The copper long distance line should, however, be kept out of the cable. In crossing the railroad track the use of copper clad wire is advisable.

Cross Talk in Cord Circuits.

I have examined a great many common battery circuits and cannot see why they have not the same condition described in TELEPHONY of January 24, pages 21 and 22. In fact, some of them look to me as though they would talk just as well without any connection through the cord circuits as with. I understand, of course, that feeding battery through impedance coils minimizes cross talk. But



Retardation Coils in Cord Circuits to Prevent Cross Talk.

the only way I can see to eliminate it would be by cut-off relays and a separate battery for each cord circuit—not exactly a common battery. Each transmitter must cause undulations through the battery. Now, what keeps them from mutual interference?

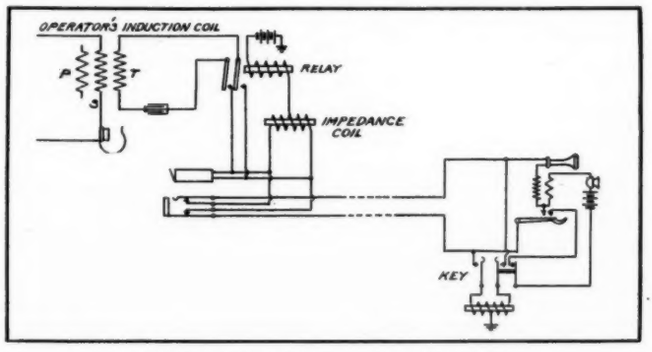
The answer to the question lies in mechanical arrangements rather than theory.

Cords are shown in the sketch connected to the bus bars without retardation coils in the circuit. They are practically connected in multiple and, as the resistance of the bus bars would be less than that of the batteries, they would be in reality cross connected. By inserting the retard coils as in cords *Y*, the path through the battery is of less resistance.

This also applies to the operators' circuits. Without the proper insertion of the retardation coils, or resistance of some sort, one set would be merely an extension of the other, unless the resistance of the circuits were high.

Monitoring the Operator from a Distance.

Would it be possible to connect a metallic circuit extending 900 feet from the telephone exchange, to the operator's set at



Circuit for Monitoring the Operator.

the switchboard so as to at any time listen to the operator on duty, to find out if she is serving her patrons promptly or not? If such a circuit is possible I should be glad to know how it would work out.

If your plant and the metallic circuit are magneto or local battery operated, you can use the circuit shown in the accompanying sketch. Add a third winding, *T*, to the operator's induction coil. Carry it through a condenser to contacts on a relay, then to the terminals of the line drop. Across the same terminals, bridge an impedance with a center tap which runs through the relay winding to battery. At the telephone install a similar impedance coil with the center grounded. Lead the terminals through a key so as to throw it across the line. An auxiliary contact on the key opens the transmitter circuit.

To use the apparatus, throw the key. This cuts off the transmitter so that you cannot be heard. The bridged coil will draw current (simplex style) through the relay at central. It will pull up and connect you to the operator's induction coil. Your metallic circuit must be quiet, as the operator will hear noise.

Whenever the operator plugs into the jack, it cuts off the drop, impedance coil and all, so that even if she should happen to plug into your line and ring you while you were listening, it would do no harm. You would get the ring in the ear. Simply throw the key to remove and talk. But be sure that the jack cuts off both sides of the drop.

Distance from Power Wires to Escape Induction.

How far away from a 2,300-volt alternating current lead will we have to run our grounded circuit telephone lines so that we will not get the induction from the electric light lines. We do not parallel the electric light lines for more than 500 feet. We do not care to go to the expense of building metallic, as we can move our wires at less expense.

You might get along with your wires on the other side of the street, say 60 feet away. It would be safer and the lines more quiet if you could get half a block away, something like 150 feet. The exact amount of noise depends to some extent upon how clear from earth leakage the electric light people keep their lines.

Nebraska Independents Hold Annual Meeting at Columbus

Three-Day Convention on March 11, 12 and 13 Attended by 100 Representatives—Telephone Men of State Listen to Extended and Varied Program—Recommendations of President's Address—The Annual Banquet—Resolutions Adopted—Election of Officers

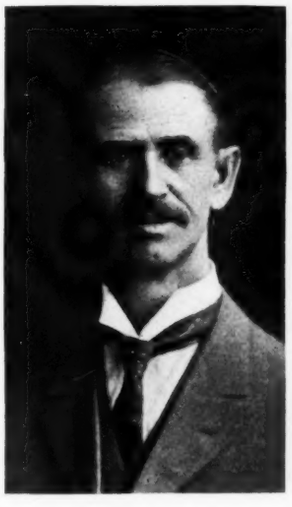
The convention of the Nebraska Independent Telephone Association was held at Columbus, Nebraska, on March 11, 12 and 13. About 100 representatives responded to roll call on the opening session. President C. J. Garlow, who presided at the meeting, introduced Hon. M. M. Rothleitner, mayor of Columbus, who delivered the address of welcome. A response was made by L. E. Hurtz, secretary of the association.

At the close of Mr. Hurtz' remarks the chairman introduced C. B. Montgomery of the French Battery & Carbon Co., of Madison, Wis., who addressed the convention on "The Manufacture of Dry Cells for Telephone Use."

Other addresses arranged for the morning session were as follows: "Value of Organization," by J. E. Grint, president of the Crownover Telephone Co., of Sargent, Neb., and "The National Association; Its Work and Value to the Business," by Hon. Warren Pratt, one of the directors of the National Independent Telephone Association.

Frank H. Woods.

C. J. Garlow.



Warren Pratt.

L. E. Hurtz.

PRESIDENT'S ADDRESS.

The program for the afternoon session included a paper by H. N. Faris, of Kansas City, Mo., entitled "The Old and the New Way" and an address by C. J. Garlow, president of the association. Mr. Garlow discussed the legislative situation in Nebraska with special reference to the action of the last legislature in passing the Fuller bill providing county ownership, the Talcott senate bill limiting female labor to 54 hours per week, and the employers' liability act. He then concluded, in part, as follows:

In the light of the present situation and the shadow of past experience of our struggles and business, and in furtherance of justice to our many stockholders and patrons, permit me to suggest that we make a united effort:

First: For the repeal of the county ownership of the telephone, or at least an amendment that will compel a payment of a reasonable sum for our going value, or the cost of securing the business.

Second: The repeal of the employers' compensation law, or an amendment that will place the corporation or telephone owner and operator on an equal basis with all other concerns and individuals against whom damages might be recovered by an employe.

Third: That the Talcott Act be amended to permit an employe to contract to work ten hours per day, if she prefers, at an agreed compensation per hour.

Fourth: That we appoint a standing committee of one from each state senatorial district to be known as the telephone committee, and of which the president of the association will be chairman, whose duty it shall be to keep in touch with all state legislation, county assessments and decisions of the supreme court, and that the association issue a monthly bulletin to be sent to every member of this association, so that we may all be posted on business events concerning our business. That said committee shall elect, or the president appoint, its workers for special occasions, and who shall be paid actual and necessary expenses while engaged upon such matters as they may be called to perform, together with $1 per day for the time consumed and that the bills therefor, be paid out of the general fund of the association.

Fifth: That a special committee of 10, of which the president and secretary of the association shall be members, be appointed from all classes of companies, which committee shall with our state telephone or public service commission try and establish a uniform rate for all classes of service.

Sixth: That all Independent or sub-licensees of any other companies be permitted to become members of this association.

Seventh: Let us ever keep in view, and make it our effort to secure sober, gentlemanly and efficient managers and linemen, and above all, to secure good reliable and efficient operators and pay them the very best wages possible. If our rates do not now justify the payment of adequate wages and salaries for good help, then let us raise the rate to justify it.

Eighth: To secure the passage of a postal telephone law whereby postmasters might open specially stamped letters and read the contents over the telephone to the party addressed.

And last, let me implore you, every one of you, whether your company be a big corporation or a small one, whether you are the individual owner or a mutual company, to never lose sight

of honest, fair and courteous treatment toward the other fellow. Do unto him as you would he should do unto you; if business differences arise, arbitrate your trouble in a good natured, manly way.

"The Business End of the Telephone," by George Coddington, of Falls City, Neb., and "The Struggles in Promotion, Organization and Retention of Business," by R. E. Mattison, of Lincoln, were other papers included in this session, which concluded with the Question Box.

The annual banquet was held on Thursday evening at Orpheus Hall. At this banquet the attendants at the convention were the guests of the Platte County Telephone Co., the Humphrey Telephone Co., the citizens of Columbus and President C. J. Garlow. The well enjoyed repast was served by the ladies of Columbus. After an invocation by Rev. Williams, President Garlow introduced L. E. Hurtz as toastmaster. The program included a number of interesting responses. The speech making program was interspersed by a group of vocal and a group of violin solos.

Friday Sessions.

The Friday morning session included a paper on "Successful Methods of Enforcing Telephone Rentals," by Hon. Geo. Becker, of Pawnee City, Neb.; "Origin and Effect of Bad Legislation," by Hon. F. W. Woods, of Lincoln, Neb.; "What are Adequate Rates for Country Service," by G. C. Presson, of Stromsburg, Neb.; "Some Things About Legislation," by L. E. Hurtz; "Missionary Work in the Independent Telephone Cause," by E. B. Dannals, of Newman Grove, Neb.; and "Am I My Brother's Keeper," by Hon. M. E. Shipley, of Hooper, Neb., member of the House of Representatives.

The Friday afternoon session opened with a paper on "National Regulation and the Obligations of the Company to the Patron," by Hon. Lewis E. Wettling, late of the engineering department of the Nebraska Railway Commission. This was followed by an address by D. S. Sylvester, of Surprise, Neb., on "How Shall We Provide for the Upkeep and Future of Our Telephone Plants?" Mr. Sylvester said in part:

The Upkeep of Telephone Plants.

The setting aside of a fund for upkeep with me is an unsolved problem. To solve this problem requires an expert, and that means high salaries. Many companies will be found to have no depreciation funds, generally through lack of thought, or any direct intent. To build up a depreciation fund is a difficult matter, after going along for years on a straight line basis. Why maintain any special fund for upkeep, such as recommended by nearly all of the state commissions? Who of us is prepared to answer what is the per cent. of depreciation of our plants in its various channels, from construction through the dividends to the share or bondholder? Upkeep comes from the effect of depreciation and the upkeep should be taken into consideration with rate making and come through the price for service charged.

In the early years of Independent telephony, I assume we did not take into consideration permanency of investment. Then about the only idea in reference to the telephone business was how to get service at the lowest possible rate, without any thought for the future welfare of the company. Following along this cheap thought is where many a poor foundation was founded, not thinking of the expansion and magnitude that the whole telephone business now assumes. Upkeep from depreciation was not thought of, consequently unprovided for, by many companies, but its necessity is now a fact and recognized as such by law.

If the rates charged are not sufficient to meet operating and all expenses including upkeep, and a fair dividend to the shareholder, either get an increase in rates by proper showing to the commission, or sell out your plant to some company who may feed the plant, and maintain the upkeep before you go into the hands of a receiver.

A telephone company, local, state or national, is not a charitable organization. It is a business concern and will not exist when not profitable as a business. Telephony should have basic principles and these principles should be adhered to in all of its various branches. Common sense and ordinary business instinct demand that this shall be done.

To say that local people shall own the plant and then demand a law that prevents any profit from operation is absurd and not in keeping with any basic principle known to business. I hope we, as Independent people, are liberal and broad enough to try the placing of the whole telephone industry on a permanent paying basis.

Since the Independent companies have entered the field of telephony, conditions have changed very much, and we must keep moving to meet these new conditions and be willing to adjust ourselves to new policies, one of which is co-operation.

By co-operation with any and all companies, it is not necessary to abandon any really important position we have taken in the past. It may be necessary to modify some of our principles and to discard some lines of action which we may have followed for years; that also would be true with our co-workers. The time is here now when old antagonisms and suspicions which have hindered development and rendered profitless the telephone business, should be discarded.

Legislation and rulings by the Interstate Commerce Commission and our state railway commission, have brought about many new and welcome phases, none of which, that I know of, is detrimental to the local companies, but in the interests of telephone users in general. I believe that what is for the best interest of the telephone business as a whole, will in an equal measure benefit all companies.

When telephone companies all over the state are asking the state commission for permission to increase rates as a means whereby they may keep up their plants, pay off indebtedness, have a fair profit on business and live, it certainly would seem that it is a necessity.

Another address provided for this session was that on "Harvesting Poles and How to Increase Their Life," by L. L. Hill, of Minneapolis, Minn.

Report of Resolutions Committee.

At the close of the discussions, the resolutions committee presented a report which was unanimously adopted. This report included the following:

Be it resolved, that we urge upon the state railway commission the necessity of establishing standard rates which may be charged at all exchanges similarly situated.

Be it further resolved, that the members of this association recommend the execution of connecting contracts covering their connection with other companies.

Be it further resolved, that we commend the action of the National Independent Telephone Association in moving its offices to Washington, D. C., and we urge our members to avail themselves of the advantages of the new location by appointing the secretary their legal representative in Washington.

Be it further resolved, that we condem the action of any manufacturers in attempting to form mutual companies in territory already occupied by Independently owned companies. Such action is unfair, uneconomical and inimical to the interests of the members of this association.

Election of Officers.

The following officers were elected: President, C. J. Garlow, Columbus, Neb.; vice-president, Warren Pratt, Kearney, Neb.; secretary and treasurer, L. E. Hurtz, Lincoln, Neb. The executive committee includes the following members: Warren Pratt Kearney, chairman; G. E. Becker, Pawnee City; F. H. Woods, Lincoln; A. S. Howard, Kenesaw; C. J. Garlow, Columbus; L. E. Hurtz, Lincoln; C. M. Beck, Gibbon. District vice-presidents were chosen as follows: First district, J. D. Crownover, Sargent; second district, B. G. Miller, Crete; third district, Robert Greenwood, Nelson; fourth district, Alfred Bratt, Genoa; and fifth district, James Murphy, Odell.

Handling the City Street Railway Traffic by Telephone

Problem of Handling Street Railway Service in Rochester, N. Y. Solved by use of Telephone—Lay out of Streets and Topographical Features of City Added to Complexity of Situation—The Telephone Dispatching System and Equipment

The handling of street railway service in Rochester, N. Y., is a big proposition, one that has occupied, at various times, the minds of some eminent traffic experts. The underlying reason for the complexity of the problem is found in the topographical features and in the layout of the streets in the central section of the city.

There are two main transfer points, one on each side of the Genesee River which flows through the heart of the city, dividing it very nearly into halves. The majority of the 14 lines radiate in all directions from these transfer points, like the spokes of a wheel. The main street extends through the two main intersection and transfer points and it is on this connecting street where the greatest congestion occurs during rush hours. It naturally follows that the dispatching of the cars during the peak load is considerable of a problem. During the less busy hours of the day, about 150 cars suffice to handle the traffic, but during the noon hour and also between 5:30 and 6.30 p. m. from 300 to 350 cars must be pressed into service. On some lines, headways as low as 1¾ minutes are maintained.

The dispatching question has been very nicely worked out by the railway company by the use of a very complete telephone system to reinforce and augment the work of 12 inspectors and several street aides. The inspectors travel over the lines continually, to assist in maintaining the scheduled time of the trains, while the street aides are stationed in the congested districts, assisting the traveling public by announcing the destination of approaching cars, answering inquiries and making themselves generally useful.

The dispatcher or rather a chief dispatcher and several assistants are stationed at a special dispatching telephone switchboard located in the offices of the transportation department in the railway company's office building. This switchboard is connected, by means of leased wires from the Rochester Telephone Co., to telephone sets located at every line terminal and at main intersections. Sets are also located at canal lift bridges, grade crossings and other points where delays are most liable to occur. The illustration shows the general appearance of the out-of-door telephone installations.

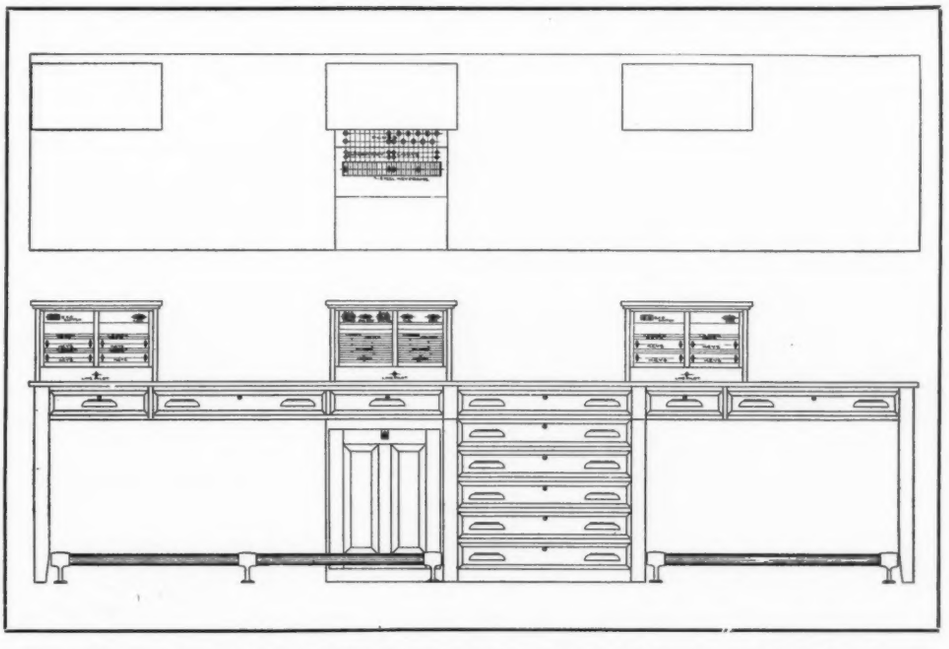
Each motorman is required to report immediately upon arrival at a terminal, giving the dispatcher the number of the train under his operation. The act of taking the receiver off the hook at the terminal telephone, immediately illuminates the line lamp at the dispatcher's switchboard. The dispatcher answers the call by simply pressing a key corresponding with the lamp, which places him in direct connection with the motorman.

After receiving the train number, the dispatcher gives the motorman the time for his departure from that terminal and any special instructions that may be needed. The system in this way gives the dispatcher the exact location of all cars and advises him of any gaps in the service. In case of gaps, he can easily order out "trippers" to fill in until service again becomes normal.

The switchboard used at the dispatcher's office is made up in the form of a flat top desk having mounted on it three turret apparatus cabinets. Two turrets include straight dispatching line equipments, while the third is a combination dispatcher's and commercial board. During the rush hours, three dispatchers are required, but ordinarily one or two are sufficient. Two of the turrets each contain 40 dispatching lines, while the third carries 20 dispatching lines and also a multiple of 60 commercial lines appearing in the railway company's private branch exchange. This arrangement permits the night dispatcher, whose duties are light, to care for the commercial business, thereby eliminating a night operator for the commercial or regular private branch exchange board.

Motorman Reporting to Dispatcher.

Plenty of space is provided on the top of the desk for schedules, train sheets, etc. A tier of drawers accommodates past records, special schedules and a supply of dispatching stationery. The train sheets, arranged by train number and also in chronological order, are always before each dispatcher so that



Plan and Elevation of the Electric Railway Dispatcher's Switchboard in Rochester, N. Y.

the whole traffic situation at any moment can be read at a glance. The benefits of this system are readily apparent even to the layman. Not only is the best of service under normal operating conditions assured but a means for rapidly straightening out traffic tangles caused by delays is also provided. The system gives the railway company a permanent record of every train movement, late cars, times of accidents, etc., and information which is invaluable in cases of lawsuits, as much testimony in damage suits is based upon the memory of witnesses, which at times is conveniently in favor of the plaintiff. Furthermore, tain crews will promptly report trouble with cars and give many details which they would not bother themselves with in making out in written form.

The equipment used on this system was manufactured by the Stromberg-Carlson Telephone Mfg. Co., and was installed by the Rochester Telephone Co.

Annual Reports and Meetings of Telephone Companies

Statements Given Out by Telephone Companies in Various Parts of the Country Relative to Their Operations During the Past Year—Summaries of Earnings and Expenses—Growth in Number of Subscribers and Equipment—Provisions for Future Development

Conestoga Telephone Co. Issues Annual Statement.

The Conestoga Telephone Co., of Birdsboro, Pa., reports for the year ending January 1, 1914, earnings amounting to $10,843. After paying operating and maintenance expenses, interest amounting to $125 and dividends of $1,926, the company had a balance on hand on January 1, 1914, of $1,008.

The statement of assets and liabilities shows capital stock outstanding of $33,720, loans $2,960 and bills due for operating and repairs, $543. Under assets the value of the lines is placed at $34,926. Outstanding rents and tolls amount to $861, while $150 is due from other telephone companies. Supplies on hand amount to $250. The total assets and total liabilities are each $37,223. During the year $2,700 was spent on repair material and labor on repairs.

The companuy has elected John A. Smith as general manager of the Birdsboro exchange and John K. Stoltzfus, of Morgantown, Pa., as district manager for Morgantown and superintendent of construction. The company has installed a two position board at Morgantown and operates 345 telephones on this board, 63 having been installed last year. At Birdsboro 45 telephones were installed during the year and the company operates a total of 815 telephones. Birdsboro will have all aerial cable and copper trunks.

Earnings of Keystone Telephone Co.

The Keystone Telephone Co., of Philadelphia, Pa., has issued the following comparative statement of earnings of the combined companies:

	For Month Ended Feb. 28, 1914.	Year Previous.	For Two Months Ended Feb. 28, 1914.	Year Previous.
Gross earnings	$107,781	$102,887	$215,259	$206,913
Operating Expenses and Taxes	51,842	50,375	106,121	104,787
Net earnings	$ 55,939	$ 52,512	$109,138	$102,126
Less Interest Charges	26,488	25,203	53,220	50,778
Net Surplus	$ 29,451	$ 27,309	$ 55,918	$ 51,348

Annual Report of Mankato Citizens Telephone Co.

The annual report of the Mankato Citizens Telephone Co., of Mankato, Minn., for the year ending January 1, 1914, presented at the recent "get together" meeting and dinner of the stockholders, shows the 15th year of the company's existence to have been a prosperous one. Sixteen years ago the company had 250 telephones and now has 3,050, said President Patterson, in reviewing the company's record. V. D. Willard, secretary and treasurer of the company stated that the company is now expending $6,500 in the installation of its new and improved switchboard, and that during the past year there was an increase of 21 per cent in the amount available for dividends, over the preceeding year. The financial statement of the company (cents omitted) is as follows:

ASSETS.

Plant	$197,303
Stores account	3,548
Accounts receivable	3,328
Cash	1,109
	$205,288

LIABILITIES.

Capital stock	$144,275
Bills payable	15,200
Depreciation reserve	28,973
Taxes payable	1,605
Salaries payable	707
Profit and loss	14,528
	$205,288

OPERATING INCOME.

	Amount.	Per Station
Telephone rentals	$48,738	$17.25
Toll System	2,181	.76
Earnings from connecting lines	948	.33
Commission from Tri-State toll	1,170	.44
Rents from pole and wire privileges	235	.08
Ads in directory	189	.07
Total operating income	$53,461	$18.83

OPERATING EXPENSES.

Maintenance	$15,559	$ 5.48
Expense	8,858	3.12
Reconstruction	2,711	.96
Total expenses	$27,128	$ 9.56
Net income	$26,333	$ 9.37
Deduct depreciation	9,288	3.28
	$17,045	$ 6.09
Add rents from building	400	.14
Miscellaneous non-operating income	50	.02
	$17,495	$ 6.25
Deduct interest paid on bills payable	1,141	.04
	$16,354	$6.21
Deduct dividends paid	10,083	3.55
	$ 6,271	$ 2.66
Deduct uncollectible	176	.06
Surplus for year	$ 6,095	$ 2.60
Add surplus on hand	8,434	2.97
Total surplus	$14,529	$ 5.57

The report shows an increase of $2,766 for telephone rentals and $1,545 increase for tolls, making a total of $4,311 or 8.6 per cent.

The operating expenses show an increase of $1,846, or 7.3 per cent.

The plant account has increased $9,384 during the year and the bills payable have been reduced $7,200.

When the company first started in business, March, 1899, it had 250 subscribers, and at this time it operates 3,050 telephones.

Manager P. M. Ferguson stated that there had been during the year an increase of 299 telephones and that there is now one telephone to every five persons.

Statement of San Marcos (Texas) Telephone Co.

The San Marcos Telephone Co., of San Marcos, Texas, has issued a statement of the condition of the company as of December 31, 1913. The company has 650 subscribers. The total resources are shown to have been $34,085, of which the plant account is $33,648 and accounts receivable $422, and cash on hand $15. The liabilities include capital stock $20,000, surplus $6,000, net earnings $4,561, reserve for depreciation $699, taxes accrued $120, interest accrued $286, bills payable $1,500, accounts payable $475, and due to bank $444.

The statement of earnings is as follows:

Rentals for exchange service	$10,689	
Commissions on toll business	599	
Directory	16	
Tolls	21	
Gross earnings	$11,325	$11,325
General expense	2,459	
Operating expense	2,526	
Maintenance, repairs, etc	819	
Insurance	197	
Taxes	458	
Interest	122	
Miscellaneous	183	
Total expense	$ 6,764	$ 6,764
Net earnings		$ 4,561
Depreciation	1,698	
Balance to surplus account	2,863	
	$ 4,561	$ 4,561

Report of Chesapeake & Potomac Telephone Co.

The Chesapeake & Potomac Telephone Co. reports for the year ended December 31, last, total earnings of $1,506,752. The balance sheet as of December 31 shows cash and deposits of $75,468; marketable securities $1,493,000, current accounts receivable $111,242; current accounts payable $103,892; unappropriated surplus $116,240 and total assets and liabilities of $8,195,815.

The statement of earnings is issued in connection with the sale of $1,000,000 first mortgage 5 per cent. gold bonds dated May 1, 1913, and due May 1, 1943, out of a total authorized issue of $5,000,000 of which $2,500,000 is reserved for future requirements and $493,000 held in the treasury of the company.

For the year ended Dec. 31 last the company earned over 2½ times its annual interest charges, after deducting 20 per cent. of gross earnings for depreciation. Dividends are now being paid at the rate of 5 per cent. on the $4,100,100 common stock.

Rural Telephone Debentures of Western Canada.

With the rapid spread of the rural telephone in Western Canada, says Canadian Finance, of Winnipeg, Manitoba, Canada, there has become available a new class of profitable and well secured investments. Under the Rural Telephone Act, passed by the Saskatchewan legislature in 1913, provision is made for the issue of debentures by duly organized rural telephone companies within the province. As investors are not yet generally familiar with this class of debentures, a resume of the procedure followed in their issue and the security offered should prove interesting.

If five or more persons desire to construct and operate a rural telephone system for their mutual benefit, they can present a petition to the Minister of Telephones asking for the organization of a company for this purpose. The minister, upon being satisfied that the petition should be granted, takes all steps necessary to secure the organization, incorporation and registration under the Companies' Act, free of all fees or charges. Capitalization of the company is limited to $10 per pole mile of line to be constructed. The capital is divided into equal shares of $5 each, and any number of shares not exceeding four may be allotted to one subscriber. The government allows a telephone company to borrow a sum not exceeding $350 per pole mile for the purpose of constructing, reconstructing or improving a telephone system. Such loans have to be authorized by the directors of the company and the resolution contains an enumeration of the lands which are to be charged with the payment of the proposed loan. These lands comprise every quarter section of either side of the route of the proposed line and also every quarter section any part of which lies within a distance of one hundred yards from the proposed line. A certified copy of this resolution is then sent to the minister and if satisfied that the conditions of the act have been complied with and that the proposed loan is reasonable, he authorizes the company to borrow the sum mentioned or such less sum as he deems fit.

Debentures are then issued and in due course receive the countersignature of the minister, such countersignature validating the debentures. These debentures then create a lien for the payment of the principal and interest against all the property of the company, as well as against every tract or parcel of land enumerated in the resolution. Every year the secretary-treasurer of the company has to notify the rural municipalities in which the system operates, of the amounts to be levied on each parcel of land, for telephone purposes, and the secretary-treasurer of the municipality levies accordingly at the same time and in identically the same manner as for school and other taxes. The same means for collection of arrears of taxes are put into force as in the case of other levies and taxes for telephone purposes are payable at the same time as other municipal taxes.

It will be seen from the foregoing that these debentures are backed by a substantial security. Already the attractiveness of such issues is creating a considerable demand.

The Telephone Stations in Georgia.

The forthcoming report of the Georgia Railroad Commission states that on September 1, 1913, there were 90,189 telephone stations in Georgia, 74,731 exchange stations and 15,458 farmers' line stations.

There were in the state on the date named 245 telephone exchanges of which 97 were operated by the Southern Bell Telephone & Telegraph Co., 14 by the Gainsboro Telephone Co., and 134 by Independent companies.

The Southern Bell had 54,516 exchange stations and 8,247 farmers' line stations. The Independent companies and the Gainesboro Telephone Co., operated 20,215 exchange stations and 7,202 farmers' line stations.

Nearly one-fourth of the total number of stations in the state—21,294—were located in or served as a part of the Atlanta exchanges of the Southern Bell and the Atlanta Telephone & Telegraph companies. Augusta had 4,379 stations, Macon 4,670 and Savannah 5,836.

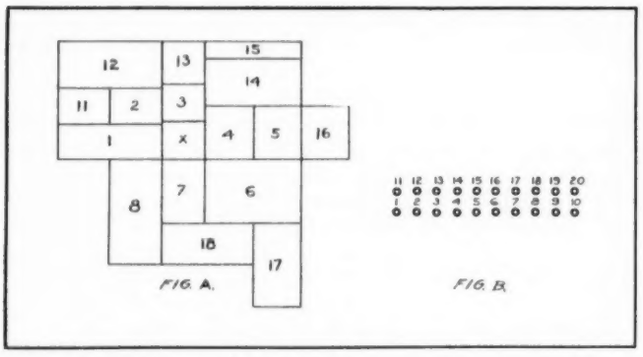
The 90,189 stations of all kinds were divisible as follows:

Straight line business stations	22,415
Extension business stations	3,559
Straight line residence stations	45,062
Extension residence stations	2,016
Public toll stations	644
Farmers' line stations	15,458
Stations at free or reduced rates	1,035

Practical Subjects—Letters and Discussions

Arrangement of Farm Line Board for Operating Efficiency.

Saving the operators' time by proper arrangement of farm lines on the board, is a subject which deserves a little attention. Fig. *A* of the accompanying illustration is the sketch of an exchange district. The exchange is represented by *X*. The squares represent approximately the territory served by the



Sketch of Exchange District and Arrangement of Farm Board.

various farm lines. Fig. *B* represents the front of the switchboard.

Now a subscriber on No. 12 will call his neighbors on Nos. 11, 2, 3 and 13 oftener than he will call for Nos. 17 or 18. We will imagine a natural division between Nos. 1 and 8, which makes No. 1 the logical point to begin numbering around the circle. Such a division will be found in most districts.

We have an exchange serving 30 farm lines, eight to 15 subscribers per line, the lines being scattered over a two-position board. On most connections the operator formerly had to reach across the board. Picture the tangled cords and confusion during rush hours! A careful rearrangement of the lines worked wonders and it did not take long, either.

Moral (a la Kelsey): Take a look at your farm line board.

Michigan. H. A. D.

Letters to His Old Boss.

Bessemer Hump.

My Dear Pinder:

Inasmuch as you asked me to write, I feel bound to do it. I guess I should have done it anyway. I owe you something but I can't just make out what it is. You're the fellow who told me to get into the telephone business for myself, as it was the best business on earth. This I know is two-thirds truth—for it is a business and it is on earth. About the other third, I am not thoroughly convinced. It certainly is a busy business. If it isn't some little thing, it's some big thing always just around the corner. You run plump into it without knowing it's there and without any preparation.

As you suggested, I came out here and bought an exchange, rebuilt and enlarged it, and have what you'd call an attractive and prosperous business—or rather I had just that. Now, after five years on the job, I don't know what I have got. But there is one thing to rely upon: Yes, sir! I can unship my oars and lie back in the boat without fear that this telephone business of mine will run or be run amiss.

But by this time I know you'll be asking: "What's this all about? What are you so worked up over?" You said that to me many times before I graduated from office boy to a clerkship and you used to send me home with those two homely Dobson girls on dark, rainy nights. Say! They haven't any relatives who resemble them, that you could send me? I've changed my opinions a lot about good and bad looking operators—yes, sir, considerable much.

I've come to the conclusion that sometimes we overlook the differences in the application of the two common words, "looks" and "appearance." In our business, looks are not the greatest asset—but appearance counts for a great deal. It is a badge of habit and character. You remember those Dobson girls had a distinctive manner of appearing neat, and it showed in the performance of their duties.

There are a great many elements that enter into consideration in fixing the value of an operator's service. One that I include in my catalog is the consideration shown by subscribers. I consider little favors, such as candy, flowers, etc., a criterion of the treatment patrons are receiving, taking into the equation, of course, the spirit which prompts the giver. In a town of this size, one can judge pretty accurately about such things.

But I have strayed away from the text I set out to follow. I am not at present devoting much time to establishing a 99 per cent. standard of operating, or if you'd rather, a 99 per cent. pure article of service. While the board of assessors is hounding me for a schedule and want to make the schedule themselves, and to suit themselves or their constituents, operating go hang, I say!

They do, however, condescend to allow me to express my opinion in their august presence, as soon as they get it framed up to suit themselves. I presume we'll come to an agreement sometime. After four months, they are getting pretty fussy about it. Ever stop to think how many angles there are to fixing the value of a thing for a certain purpose, especially a thing of such varied composition, and so many ramifications as a telephone plant? I'm up against the angle for the purpose of taxation.

You may remember when I was office boy, I was somewhat inquisitive. I can't think you have forgotten the habit I had of asking what things were worth. I've found it to my advantage to recall many of your answers, during the present season of schedule making. As I recall them, your answers at various times, given under different conditions, cover the entire field of inquiry, which is widespread today, to the limits of the land.

To my oft repeated question, "What's the thing worth?" I will catalog here your various answers.

"It will be worth twice what it cost in five years."

"Just what I paid for it."

"Just what I can get for it."

"Just twice as much as it cost new."

"Less than nothing, because I'll have to pay someone to take it away."

"Just what a new one will cost, but no one would give that much for it."

"Just about half what I paid for it."

"Just what I paid for it, less 12 years' depreciation on an estimated ten-year basis."

That one puzzled me a lot, but it doesn't so much now. Here is another one:

"Just twice as much as it cost after five years' wear and tear."

"I wouldn't trade it for a new one and no one with any sense would offer me a new one for it."

When this board of assessors asks about the value of various units, and they do condescend to inquire sometimes, I hand them one of the answers you handed me. Then I take up the remainder of the session explaining what it means. They had a very plausible scheme mapped out, having listed the principal items that go to make up the plant and, after each unit or item, they had placed a valuation figure. When they could arrive at what they thought was just, they could easily multiply by the total number of each unit and land flat-foot on an equitable grand total.

Each one had promised to be home early for supper that night, but instead they all ate sandwiches and drank lukewarm coffee. When they have a session now, they leave word for the folks at home to look after the furnaces, and not to waste time putting papa's slippers in the warming pan.

The first item they had cataloged was poles. They didn't expect that item to cause them a moment's worry. Two whole sessions were devoted to it and we are to revert back to it when we get to the bottom of the list. They argued it down to a "foot basis," they call it; that is, they are going to fix a value of so much a foot for every foot of pole I have above ground.

But I'll not go into that this time. I have hopes of getting off this year for last year's assessment which was about fair, according to my way of thinking.

Will tell you about the pole item next time. Remember me to the Dobson girls, for I'll bet they are the only ones left that I knew. They are not liable to forget

Little Dudley.

Cable Maintenance As Viewed by a Trouble Shooter.

By O. F. Tallman.

Cable has become one of the most important assets of the telephone business, on account of its ability to reduce the cost of maintenance, and increase the quality of service; and as that word "Service" is the keystone of the telephone industry, it would naturally follow that such an important factor as cable, should receive the care and attention due its importance.

It should be installed so as to minimize the chances of trouble. It should be kept clear from trees, guy wires, poles and all objects which might cause injury to the sheath, but when it isn't possible to clear, some suitable protection should be provided. This precaution should be taken to reduce the chances for trouble, for up to the present time no way has been devised to keep cable clear from all trouble, as some are due to unforeseen causes. That class of trouble can only be taken care of as it appears.

One of the most common causes of trouble is where either the cable itself, or a line feeding through it, comes in contact with a high voltage wire. When this happens to the cable, the trouble will generally all be found at the point where the contact was made. This trouble may show up at the time by putting from one to all the lines out of service, or it may not show up until some future rain has caused the core of the cable to become wet, through the hole in the sheath caused by the "hot wire."

When "a drop" or line feeding out of a cable becomes crossed with "hot stuff," the high voltage current is carried into the cable, unless protection at the terminal can check it, and causes what is termed, "scattered trouble," or "inside burns." In this class of trouble, one contact with a hot wire may put the whole cable out of service, and the trouble be scattered to the ends of the cable. Experience has proven that a low voltage, say 500, is much more disastrous than high, say 2,300 volts. The 500-volt current "lays there and soaks," burning through the points of low insulation, while the 2,300-volt current takes a more direct route to ground, and does not cause so much damage.

Another form of trouble, called "static discharge," is caused by cable not being properly bonded. It will be found at some point where the cable forms a high resistance contact with messenger, hangers, or guy wire. A very common trouble is caused by a sag in the cable, due to too much slack, broken hangers, or tie, throwing an unnatural vibration and strain on the sheath, causing it to check, and crack, or crystalize, leaving the core unprotected.

There are many other ways in which cable may be damaged and service crippled; in fact, it would not be possible to catalog all causes for cable troubles. We might think we had them all, and find the next case to be something unheard of before.

The most important thing, when the trouble comes on, is to "get it as soon as possible." A bad habit, which is quite prevalent, is that when only a part of a cable goes bad, say two or three pairs, the first question one hears is: "Can you make any cuts, and get the lines O. K.'d?" This would be all right if the case were followed up, the cause located, and the trouble cleared; but so long as there is a spare pair available, the trouble is usually neglected until all the spares are used. Then perhaps a rain comes, and the whole cable will probably be put out of commission.

It is not possible to tell the cause of a trouble, until it has been located and examined. It can be guessed at, from past experiences, but that is poor policy. I have seen cable, as large as 100-pair, two-thirds burned, causing only two telephones to be out of service. I have found holes in sheath caused by bullets, nails, spur holes, hot wires, etc., and no lines out of service; holes that had been there from three to six months. As an example: telephone No. 572 is reported to be grounded. The troubleman goes to the terminal from which this line works out, and opens it up for a test. He find the trouble to be in the cable, makes a cut, and O. K.'s line, which is, apparently, all that is necessary. But the next week it rains, and 50 lines are put out of service. This could have all been avoided if the trouble had properly been attended to at first.

Take a case of "inside burn"; that is, when the wires are crossed inside, but with no damage done to the sheath. Such a case is, apparently, safe enough, and is, so far as moisture is concerned; but the insulating properties of the paper have become so damaged, that the current from a generator will very often burn across and damage adjoining pairs. A good comparison would be of that of one bad apple in a barrel of sound ones; unless it it removed, the whole barrel eventually becomes contaminated.

In locating this and in fact all cable troubles, I find what is known as the Matthews' Telefault, to be invaluable, because it saves us time and expense. Before this instrument was used, the locating of trouble was slow and expensive, for it took in some cases, from one to two days to locate one case of trouble.

The usual process was something like this: First, an approximate location was made with a loop meter or galvonometer. Then the distance taped off to the point of location, either from the office or terminal, where loops were put on for the reading. Then the search began. If nothing were found, an opening would be made in the sheath, for a test to determine which way the trouble showed. Another look, then another opening would be made in the direction of the trouble. This ceremony would be accompanied with a prayer for the trouble to be between the two openings.

If lucky enough to corner the trouble, the cable would be ridden, and if nothing were discovered, a third opening would be made half-way between the two previously made, and so on until the distance had been reduced to a span or less. If nothing could then be found, a new section of cable would be cut in.

The method of today is much shorter. In some cases where the cable is very long, a location is first taken with the loop meter, then the Telefault tone, or interrupter, is put on in the office. If the trouble be a ground, one side of the tone is attached to ground, the other to the pair or pairs in trouble. If it be a short, the tone is looped in series with the pair shorted. The object is to form a complete circuit with the tone and trouble to be located.

The Telefault exploring coil is then taken to the point located by the loop meter test. If the tone is heard at this point, the trouble is farther out; if it is not heard, it is between there and the office. It is hardly ever necessary to make over three or four tests until a point is found where the tone stops. The trouble will be found at this point because the trouble closes the circuit formed with the Telefault in the office. From three to five cases of trouble may be located in this manner per day.

From Factory and Salesroom

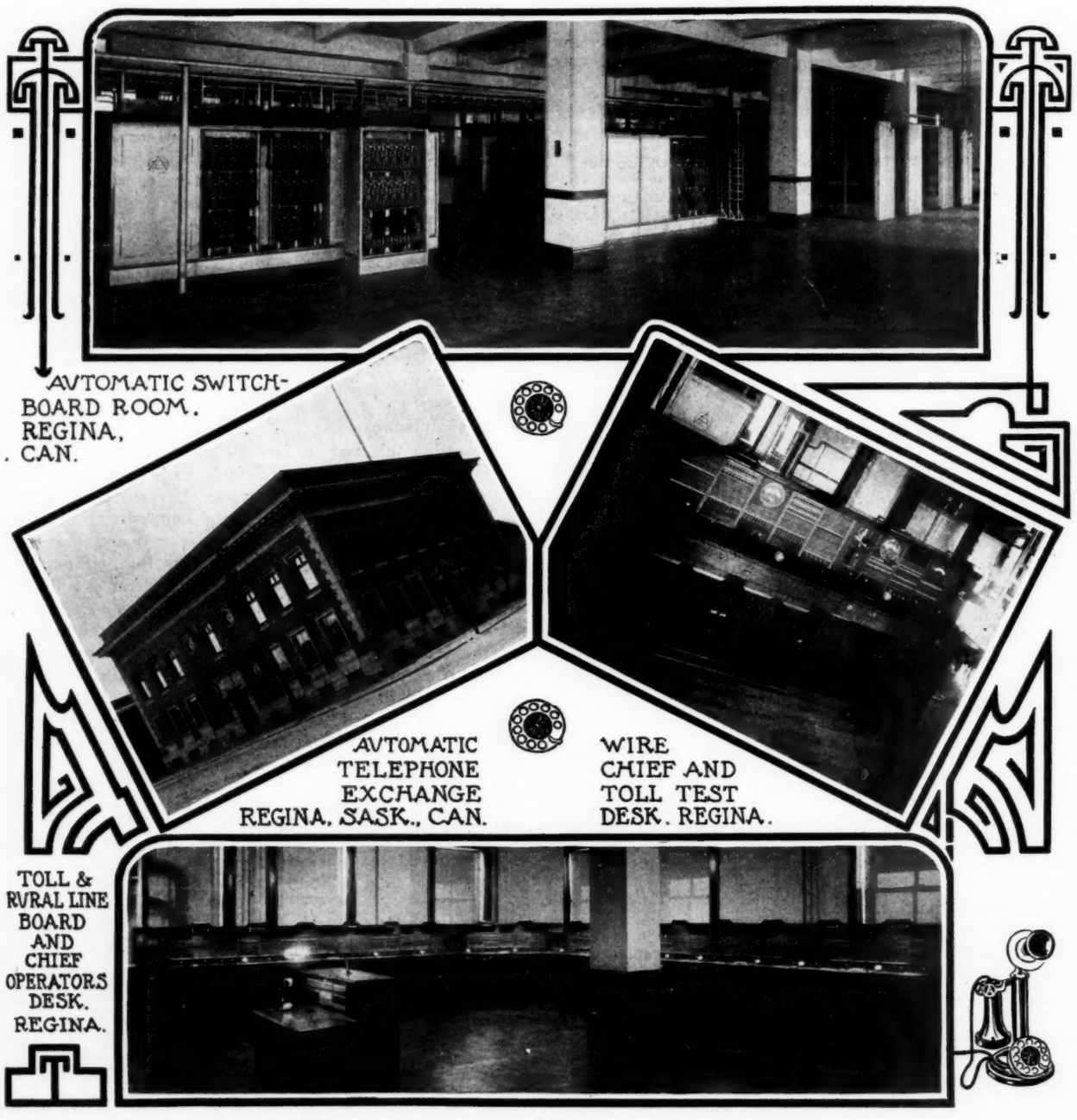
Conventions: Missouri, May 6, 7; Tri-State, Jackson, Tenn., May 19, 20; Railway Telegraph Superintendents, New Orleans, May 19, 20, 21 and 22

New Automatic System at Regina, Saskatchewan.

The 3,600-line automatic telephone plant installed at Regina, Canada, by Automatic Electric Co., of Chicago, was cut into service at midnight January 17, 1914, by the officials of the Saskatchewan provincial government.

Under the direction of W. Warren, chief engineer of the telephone and telegraph department, men were stationed at the main frame of the old exchange, where strings had been placed behind the heat coils. Pulling these cut the manual board out of service, and the crew then went to the automatic switchroom, in the new telephone building, adjacent to the old structure, and quickly removed the toothpicks placed in the protectors, thereby opening the lines to the automatic switchboard. In the automatic switchroom, a man was placed in charge of each group of 500 switches and these men were able to detect any troubles as soon as the tooth picks were pulled. The actual time for cutting the exchange into service was 30 minutes.

On the following Monday and Tuesday, the traffic was heavy and the complaints numerous, but by the co-operation of the government forces and the Automatic Electric Company's installers, the troubles incident to a cut-over were cleared within a short time and the service soon compared very favorably with any automatic exchange.


AUTOMATIC SWITCH-BOARD ROOM. REGINA, CAN.
AUTOMATIC TELEPHONE EXCHANGE REGINA, SASK., CAN.
WIRE CHIEF AND TOLL TEST DESK. REGINA.
TOLL & RURAL LINE BOARD AND CHIEF OPERATORS DESK. REGINA.

Views of Automatic Telephone Exchange at Regina, Saskatchewan.

The new building which houses the automatic plant at Regina is 85 ft. long by 75 ft. wide, two stories and basement, and is entirely fireproof. A forced ventilating system is used and a vacuum system for cleaning the switchroom, switchboards, etc., has been planned, but not entirely installed to date. In the basement are located the power, heating and ventilating plants and a branch store-room for small supplies. The power plant is in duplicate and so arranged that a failure of the commercial current normally used, will not cripple the telephone service.

The exchange is completely equipped with powerboards, ringing and "busy back" machines, and all other accessories necessary for giving automatic service, the whole being manufactured and installed by Automatic Electric Co.

One of the most interesting features of the Regina exchange is the 16-position toll board, also manufactured by this company and so arranged that its operation is reduced to a very simple form. The general arrangement is as follows:

The first and second positions are wired and equipped as toll recording positions with key ending toll recording trunks which give discriminating tone test service on all calls. The third and fourth positions are wired and equipped for through switching and are arranged to connect toll-to-toll calls. The fifth position is wired and equipped for rural service, with a capacity of 50 rural lines. The sixth position is wired and equipped for pay station service, with a capacity of 60 pay station lines. The seventh to the 16th positions, inclusive, are wired and equipped as regular long distance positions, with a capacity of ten answering jacks per operator. The second and third positions are arranged as the night section.

The cord circuits on the long distance positions are of the combination type and are arranged to handle calls from long distance to automatic, and vice versa.

The cord circuits on the through positions are of the single supervision type, because of transmission standards. Some of these cords are equipped with repeating coils and some are not, and are distinguished by the color of shell on the plug.

The cord circuits on the rural, pay station and night positions are of the universal type, designed to handle the following calls: Automatic to rural; automatic to pay station; automatic to toll; pay station to automatic; pay station to pay station; pay station to toll; pay station to rural; rural to automatic; rural to pay station; rural to rural; rural to toll; toll to automatic; toll to pay station; toll to rural, and toll to toll.

A cord circuit is also installed on the recording position, enabling the recording operator to advance calls to the chief and position operators when necessary.

For calling into the automatic board, service and overflow trunks are multipled into each position where the cord circuits are designed for calling into the automatic board. The "service trunks" terminate on special connectors on each unit, and the operators secure numbers over these trunks by two movements of the dial.

The "overflow trunks" are for use when the service trunks are busy. These trunks terminate on line switches in the automatic board and the calling of numbers over these trunks requires four movements of the dial. When the service trunks are used, the operator controls the ringing, but in case the overflow trunks are used the ringing is automatic. The board is equipped with "in" and "out" order wires to handle all traffic and testing conditions.

Several special features have been incorporated in this board to facilitate its operation. Chief among these are:

A supervisors' circuit, to enable the supervisors to assist the regular operators and answer calls requiring a conversation but which do not need the attention of the chief operator.

A local trunk circuit, to enable the toll operators to pass a call to other regular toll operators or to the chief operator.

The instruction circuit enables the chief operator to obtain the attention of all operators at once and transmit orders or bulletins.

An operator's switching circuit, enabling one operator to take care of two positions.

The operator's telephone circuit is designed so that when an operator's set is removed from the position switch, the calls to this position are automatically transferred to another position. When all the sets are removed, the calls are automatically transferred to the night section.

A cord test circuit, to test the cord supervision.

The wire chief's test plug circuits, to enable the wire chief to make tests on lines from the toll board.

A one position chief operator's desk is installed and equipped with circuits for supervising the toll board and information board. All necessary circuits for monitoring and handling public or toll operator complaints are installed in this desk.

A two section, four-position information board is installed in the toll room and harmonizes with the toll board. It is equipped to handle information, dead level, dead numbers, observation of traffic over automatic lines, and complaints. This board is arranged so that the complaint trunks can be answered at the wire chief's desk on the second floor. All circuits on this board are key ending, insuring rapid service.

The toll test desk and the wire chief's desk are designed as one desk. Two positions are assigned to the local wire chiefs, one for testing and routing troublemen, the other to handle subscribers' complaints and make tests through the switchboard on these complaints. These positions are equipped with test distributors so that tests can be made on any line, by means of test distributors and test connectors. These test connectors are mounted on each line switch unit in the automatic exchange. Each position is equipped with Automatic Electric Co's standard test circuit. Rack test plugs are installed so that testing can be done on the front or rear of the main frame. Howler circuits, sounder circuits, dial speed indicator circuits, and a wire chief's test switch, order wires and trunk between the other desks are installed for convenience in handling complaints and traffic. Inspector trunks, hospital trunks and observation trunks are also installed here.

The toll test desk is a combined long distance test switchboard, arranged to handle long distance testing, phantom and simplex work. The board is designed so that the phantom, composite and simplex equipment is wired and grouped so that the apparatus can be placed on any line. The long distance lines are wired and grouped so that the lines can be phantomed, composited and simplexed, and can also be patched by means of cords and plugs at any time. The composite, simplex and Morse circuits are wired in the switchboard, but the equipment for putting these circuits in operation has not yet been installed.

The "Human Tone" Vest Pocket Transmitter.

The Chisholm-Dunn Telephone Appliances, Ltd., Ont., Can., which carries a full line of telephone switchboards and construction material, is featuring the "human tone" individual vest pocket transmitter and transmitterless desk set invented by Charles L. Chisholm, a Canadian inventor, of Marysville, New Brunswick. This transmitter is a small device about an inch in diameter, is carried in a case similar to an ordinary watch case, and can, it is stated, be quickly attached to a desk set without disturbing the regular receiver, although its general adoption would make possible the use of a transmitterless desk set to which it could be attached. In the issue of TELEPHONY of March 23, 1912, this invention was described.

On pressing a button which releases the lid of the case the latter springs open like a watch, and the collapsible

mouthpiece, containing a helical spring, opens out ready for use. The diaphragm is made very small, of gold-plated silver, its dimensions and material being so chosen that its fundamental note is much higher than the frequency of the human voice, which enables it, it is claimed, to exclude the noise and confusion of tone resulting in the ordinary receiver when it is loudly spoken into. The difficulty with the ordinary receiver is held to be that when loud tones are used there is a lack of proper unison of tone between the large diaphragm and the small and exceedingly sensitive mica diaphragm or mica cap. This lack of synchronization of movement between the two diaphragms, combined with many sounds foreign to the voice, generated in the ordinary instrument itself, limits satisfactory sound reproduction, whereas it is claimed this confusion is overcome in the Chisholm transmitter.

Canadian government experts, after examining and testing the transmitter, spoke very highly of it, remarking upon the clearness and purity of tone and the absence of foreign noises.

The same company carries intercommunicating apparatus, as well as telephones for deaf people. I. W. Smith, formerly in charge of sales work for Stromberg-Carlson Telephone Mfg. Co., is in charge of sales for the company.

Warehouse of Doubleday-Hill Electric Co.

Doubleday-Hill Electric Co., 727 12th street, N. W., Washington, D. C., is especially well equipped and located to furnish electrical supplies to telephone companies in Virginia, Maryland, North Carolina, South Carolina, Georgia and Florida. The company maintains a large warehouse at Washington, D. C., where it carries a strong line of telephone construction material and wires; crossarm braces, galvanized carriage bolts, machine bolts, lag screws, locust pins, brackets, connectors, glass insulators, construction tools, etc. It is claimed that very prompt shipment can be made to southern points on account of the excellent direct freight service from Washington, D. C.

Organization of the McGraw Co.

Announcement is made that the Interstate Electric & Mfg. Co., of Sioux City, Iowa, and the Jos. R. Lehmer Co., of Omaha, Neb., have consolidated as The McGraw Co., of Omaha, Sioux City and Los Angeles, with Max McGraw as president. The authorized capital of the company has been increased to $250,000. The story of the remarkably enterprising and successful career of Max McGraw, who is 31 years of age, in building up the business, of which he now assumes the management, and of the careers of those associated with him, is told in a breezy way in the first number of McGraw's Equipper, a house organ which has been established by the company, and the first number of which is called an Acquaintance Number.

The consolidation of the Sioux City and Omaha companies is a change in name only, the two companies comprising the consolidation having been owned by the same interests controlling the new McGraw company. The consoliation marks the strengthening of the two companies, which have hitherto worked independently of each other while yet controlled by the same interests. On March 1 E. B. Perrigo retired from active management of the McGraw Co., of Omaha, and the management was assumed by Max McGraw, who divides his time between Omaha and Sioux City. A. A. McGraw, who for 26 years has been connected with the Great Western Stove Works, of Leavenworth, Kan., and who for 18 years has been manager of the Omaha wholesale branch of that company, doing a business of a half million dollars a year, has succeeded E. B. Perrigo as secretary of the McGraw Co. W. J. McGraw, father of Max McGraw, is treasurer of the company, with headquarters in Los Angeles, Cal.

The McGraw Co. is an energetic organization and is equipped to furnish, in addition to its general line of lighting, power, pumping, tool and machinery equipment and supplies, whatever is required in the way of telephone switchboards and supplies.

Paragraphs.

THE GENERAL INSULATE CO., of Brooklyn, N. Y., reports an encouraging business outlook and advises that its last month's business was exceptionally good. One of its representatives has just completed an extensive trip and observed an optimistic attitude on the part of the trade.

R. S. MUELLER, manufacturers' agent, 423-425 High avenue, S. E., Cleveland, Ohio, is sending out the Cleveland Stock Sheet showing magnet wire in Cleveland stock on March 19, 1914.

W. N. MATTHEWS & BROTHER, of St. Louis, Mo., are sending out literature regarding the Matthews Telefault, accompanied by an endorsement of the instrument by F. A. Roepke, manager of the Fairmont Telephone Co., of Fairmont, Minn.

Fine New Catalogue of Smith Mixer.

A well printed and splendidly illustrated catalogue devoted to the Smith mixer has been issued by T. L. Smith & Co., of Milwaukee, Wis. This is designated catalogue No. 300. The company believes that the Smith line for 1914 is about as near perfection as can be. Several important changes have been made over last year's machine. One of the important variations is a new design of water tank. The tank is enclosed and is equipped with an air valve and a three-way inlet and outlet valve. It is also equipped with a gauge for showing the amount of water. The power tilt of the machine has been speeded up so that, in the future, the tilting action will be much quicker, and the drum will discharge with greater rapidity.

The Smith sideloader has been greatly altered. The vertical framework has been materially reduced in height, and the hoisting mechanism entirely altered and improved. The new catalogue describes and illustrates the Smith "Mascot" mixer. This is a new type of machine of light weight and the points claimed for it are its extreme portability, easily operated loader, ground level charging skip, all steel construction and four-foot mixed batch.

Also illustrated and described in the catalogue is the Smith side-gate car, which has been redesigned to give a better discharge.

The catalogue includes a capacity table which, among other information, shows the renumbering adopted for the Smith mixers. The Mascot becomes No. 104; No. 10 becomes No. 106; No. 11 becomes No. 110; No. 113 is new; No. 12 becomes No. 117; No. 13 is now No. 122; No. 14 is No. 131; No. 16 is No. 140 and No. 18 is No. 162.

Telephone companies contemplating underground conduit work, or other concrete work, will be interested in this catalogue.

Cumberland Lowers Suburban Rates Around Louisville.

The Cumberland Telephone & Telegraph Co. has announced new schedules of business and residence telephone rates in suburban towns about Louisville, Ky. Special line business rates are increased in some instances and reduced in others and two-party line rates are reduced. The rates affect Jeffersontown, Pleasure Ridge Park, Pewee Valley, Harrod's Creek, New Albany and Jeffersonville. It was announced that 19 subscribers will pay a total of $21 more while the bills of 290 subscribers will be reduced $383.

Telephone Dispatching for Queen & Crescent.

Vice-president Thomas C. Powell of the Queen & Crescent route states that the telephone is to be used for dispatching on the entire line of 296 miles between Chattanooga, Tenn., and Meridian, Miss.

Legal Cases and Decisions

By A. H. McMillan

Commission Jurisdiction Outside Incorporated Towns.

"We wrote you about January 26 in regard to some trouble we are having with some of our rural subscribers and we have your answer of January 30 in regard to the rebate we are giving for payment of rentals in advance and wish to thank you very much for your opinion in the matter.

"Now we have another question we should like your opinion upon. We have a sub-exchange about 10 miles north of us, and our subscribers on that exchange, who number about 145, have taken issue as to the manner of our doing business. They will not sign our contracts to agree to pay their rent in advance, as all of our subscribers have done in our other exchanges.

"Our subscribers in the town referred to, have now organized to build a plant in opposition. It seems they employed an attorney and sent him to Indianapolis, to take the matter up with our utilities commission and that he reported they could build lines and an exchange in the town as it is not an incorporated town and that the commission has no jurisdiction outside of incorporated towns and cities.

"We have followed up several decisions from other utility commissions upon this matter and as far as we can learn, the commission has absolute control over all utilities. It does not matter where they are located. Please let us have your opinion upon this matter and if you can furnish us any decisions bearing upon this question we will be very grateful to you for them. We enclose Section 97 of the Indiana public law in regard to granting a franchise."

"Section 97. No license, permit or franchise shall be granted to any person, co-partnership or corporation, to own, operate, manage or control any plant or equipment of any public utility in any municipality where there is in operation a public utility engaged in similar service under a license, franchise or permit without first securing from the commission a declaration after a public hearing of all parties interested, that public convenience and necessity require such second public utility. Any existing permit, license or franchise which shall contain any term whatsoever interfering with the existence of a second public utility, is hereby declared to be against public policy and is hereby amended in such manner as to permit a municipality to grant a license, franchise or permit for the operation of such second public utility pursuant to the provisions of this act."

Under Section 97 of the utility law, as above set forth, we think the commission has jurisdiction outside of incorporated towns and cities as well as within them. The law uses the word "municipality" which has been defined as "A sub-division of the state for the purpose of local self-government." States vs. Elliott, 158 Indiana, 168, 172; 63 Northeastern 222.

Unincorporated bodies such as counties and townships, although not municipal corporations in the proper sense must be construed as falling within such terms in a suit if such appears to be the intention, and cases are frequently found in the reports in which they are so designated. Davis vs. Steuben School Township, 19 Indiana Appeals 694, 50 Northeastern 1. A township has been held to be a municipality. Hughes vs. Cresco (Iowa 1906) 10 Northwestern 1109. A county has been held to be a municipality. Exparte Selma railroad company, 45 Alabama, 694; 6 American Reports 722; Pacific Coast Railway Co., vs. Porter, 74 California 261; 15 Pacific 774; Rathbone vs. Hopper 57 Kansas 250, 45 Pacific 610, 34 L. R. A. 674; Dowlan vs. Sibley County, 36 Minnesota, 430, 31 Northwestern, 517; Kennedy vs. Queen's County 47 New York, Appellate Division 250, 62 New York State 276; Carolina Grocer Company vs. Brunet, 61 S. C., 205, 213, 39 Southeastern, 381, 58 L. R. A., 687; Lincoln County vs. Brock, 37 Washington 14, 79 Pacific 477; Lund vs. Chippewa County 93 Wisconsin 640, 67 Northwestern 927, 34 L. R. A. 131.

House Moving in Montana.

"What are the laws in Montana regarding house moving? Can a contractor move a building through the streets of a city and require the telephone company to remove wires at its own expense? Does the same apply to moving buildings on public highways in the state? If a building is moved and the wires are disregarded by the mover and are damaged, can the mover be held for such damages? Could any criminal action be brought against him for such actions. Do you know of any law in this state requiring a telephone company to hold a franchise in order to construct lines in the streets and alleys of a city or on the highways of the state?"

A contractor in Montana cannot move a building through the streets and require the telephone company to remove wires at its own expense. The same rule applies to moving buildings on public highways. If the building is moved and the wires are disregarded by the movers and damages, the mover is liable for damages. The criminal action that could be brought against him would be for malicious injury to property, although he probably could show that his injury was not malicious so that it is doubtful whether prosecution would be successful. For a discussion of this whole subject see McMillan on Telephone Law, Section 240.

We do not know of any law in your state requiring you to hold a franchise in order to build lines in the streets and alleys of the state or on the highways of the state.

Rights in Street and Injury to Trees.

A realty company at St. Paul sued a telephone company charging it with negligent construction and maintenance for several years, of its lines along an avenue in the city whereby its wires came in contact with the branches of valuable shade trees situated on the property of the realty company and destroyed them. The telephone company admitted the construction, maintenance and operation of the line and denied the other claims.

The court in deciding the case held that the telephone line in a highway is not an additional servitude but the license to construct is not exclusive and the rights of the company must be considered in connection with those of abutting land owners, which from time immemorial have been recognized and deemed worthy of protection. Both the company and the land owner may be in lawful occupancy of the street. The abstract right of neither can be said to be superior, and each must be regardful of the rule that property rights must be so exercised as not unnecessarily to interfere with those of another. This principle, said the court, had been applied most frequently to the trimming of trees, which must, if practically possible, be done so as not to injure them.

The evidence showed that the company's system was erected on poles 60 feet high, from which were suspended 52 uninsulated wires hung upon five cross arms, below which were a number of wires, incased in a leaden sheet supported by a taut wire fastened to the poles. The swaying of the wires, it was shown, abraded the bark, thus causing constant loss of sap which, together with the electric discharges from the wires, and the weight of the cable resting on the branches, injured or destroyed the trees. On the principles stated above and the evidence set forth, the court held a verdict of $300 damages against the telephone company to be just. St. Paul Realty & Assets Co. vs. Tri-State Telephone & Telegraph Co., 142 Northwestern, 807.

Failing to Hold Ladder.

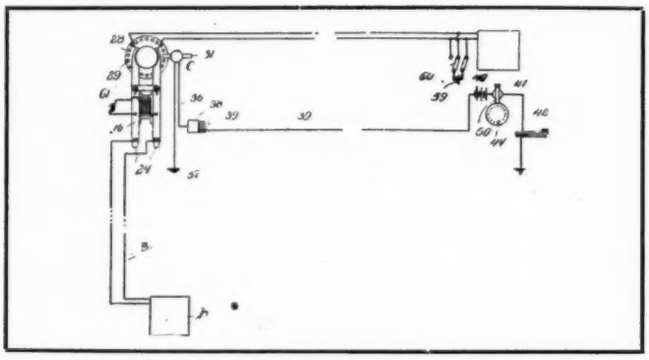
An employe of a telephone company was ordered by a foreman, under whom he was working, to climb a ladder, then resting one end upon the ground and the other upon the side of a building about 30 feet from the ground, and to attach a wire to the fixtures and insulator upon the side of a building. The foreman had placed the ladder in position and had told the workman that he would hold it. But while the workman was above, he left the ladder unprotected and walked away so that the ladder slipped and the workman fell to the ground and was injured. The workman sued the telephone company for the damages sustained.

The Supreme Court of Maryland held that the telephone company was not liable, because in placing the ladder and agreeing to hold it, the foreman was not performing a duty owed by the company to the workman. He was simply carrying out one of the details of the work and his negligence was the act of a fellow servant. Shugrue vs. Providence Telephone Co., 88 Atlantic, 616.

Record of Telephone Patents Recently Issued

1,087,127. February 17, 1914. TELEPHONIC RECEIVER; A. Marr, Manchester, England. Relates to the diaphragm mounting, a recess being left between the adjacent edge portions of the cap and body to receive the edge of the diaphragm so that when the cap is screwed down home, the diaphragm is just "clicked" off the magnet and opposite parts of it are not clamped. This construction is claimed to give greater freedom of vibration for the diaphragm.

1,087,128. February 17, 1914. TELEPHONIC RECEIVER; A. Marr, Manchester, England. Describes a receiver construction in



No. 1,088,541.

which no screws enter the ends of the magnet limbs. A non-magnetic bar is placed between the limbs of a U-shaped magnet and a non-magnetic cup is attached to the non-magnetic bar, extending across the ends of the magnet. Magnetic extensions to the magnet pass through the bottom of the cup.

1,087,704. February 17, 1914. HEAD SUPPORT FOR TELEPHONE RECEIVER; Chas. Adams-Randall, Boston, Mass. A head support for double receivers is described. It consists of a head band with receiver arms secured to it. Means are interposed between the bands for regulating the pressure of the receiver upon the ear.

1,087,807. February 17, 1914. TELEPHONE SUPPORT; K. B. Miller and C. G. Ashley, Chicago; assigned to McMeen & Miller. Describes a supporting arm for a desk set which is adjustable around a horizontal and vertical pivot. A compression spring is placed in the arm and has a compression member lying within it and extending from its upper end to a point fixed to a base block and lying above the center of the vertical swivel of the arm. A freely movable limb suspension device is attached to the other end of the arm and is adapted for engagement with the neck of the telephone set.

1,087,808. February 17, 1914. TELEPHONE SUPPORT; K. B. Miller, Chicago; assigned to McMeen & Miller. Relates to the same type of telephone arm described in the previous patent. The supporting arm is universally swiveled on top of a fixed base block to provide for non-restricting movement in a hemispherical space.

1,080,018. February 24, 1914. MEANS FOR WORKING MICROPHONES IN PARALLEL; Rudolf Goldschmidt, Berlin, Germany. Mutually inductive choke coils are connected in series with microphones which are connected in parallel. The mutually inductive inter-relation between the coils is such that with currents of equal strength passing through the microphones, their magnetizing effects are neutralized, while with currents of unequal strength, an inductive resistance is offered to the compensating currents flowing between the microphones.

1,088,270. February 24, 1914. TELEPHONE SYSTEM; Wm. A. Fricke, Chicago; assigned to Monarch Telephone Mfg. Co., Fort Dodge, Iowa. Relates to a common battery multiple switchboard system. The feature is an operator's testing key which has a normal contact from which a clearing-out relay may be controlled.

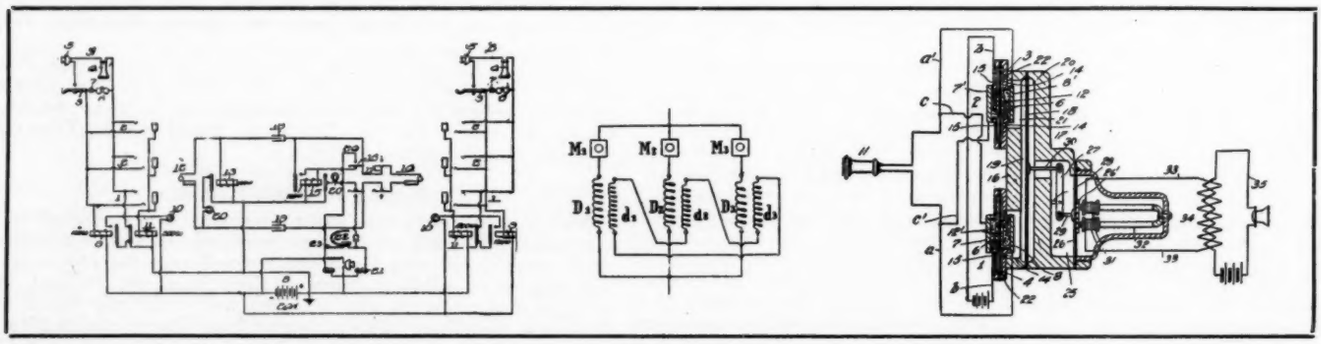
1,088,283. February 24, 1914. TELEPHONE; P. L. Jensen and E. S. Pridham, Napa, Cal.; assigned to Commercial Wireless & Development Co., of San Francisco. Describes a loud speaking sensitive telephone receiver for use in connection with wireless systems.

1,088,541. February 24, 1914. AUTOMATIC EXCHANGE SYSTEM FOR THE TRANSMISSION OF INTELLIGENCE; F. S. Coulter, Livonia, Ind.; assigned three-tenths to Wm. F. Guthrie, Campbellsburg, Ind. The features of this automatic exchange mechanism include a drum, and a shaft journaled in it, capable of longitudinal movement therein. Pairs of plugs are carried by the shaft and spaced along its length, adapted to rotate in an arcuate path. Pairs of jacks are carried by the interior of the drum and disposed in an arcuate path adjacent to the path movement of each plug. Means for rotating the shaft are provided, whereby any one pair of plugs may be brought into registration with a pair of jacks, and for moving the respective pair of plugs into the aligning jacks so that the calling and called instruments may be placed into communication.

1,088,669. February 24, 1914. TELEPHONE SUPPORT; R. M. Allen, East Orange, N. J.; assigned to Western Electric Co. This support is designed for use on a flat top desk and consists of a base and a pair of parallel, slidably related supporting arms, having opposing recesses at each end. A pair of devices are passed between the arms having lugs engaging the recesses. One of the devices is fixed to the base and the other secured to the movable member.

1,088,771. March 3, 1914. ELECTROMAGNETIC DEVICE; Wm. W. Dan, Chicago; assigned to Kellogg Switchboard & Supply Co. A bell of the tuned reed type is described. A pair of electromagnets is combined with a tuned reed, adapted to be vibrated by alternating current passed through the coils of the electromagnets in series. The tuned reed comprises a spring, a pair of armature pieces, a hammer and a supporting strip passing between the armature pieces and supporting the hammer.

1,088,870. March 3, 1914. RELAY; J. A. Birsfield, Chicago; assigned to Stromberg-Carlson Telephone Mfg. Co. The feature of this relay is an armature pivoted to be swung when the winding is energized. Switch springs for the relay lie in a plane at right angles to the axis of the pivots of the armature. Spring actuating means are carried by the armature and arranged to move crosswise of the switch springs in the actuation of the armature. An inclined plane formed on one of the switch springs is engaged by the actuating means so that a delayed or slow movement of the switch spring results.



No. 1,088,270. No. 1,088,018. No. 1,088,923.

1,088,878. March 3, 1914. ELECTROMAGNETIC DEVICE; H. P. Clausen, Rochester, N. Y.; assigned to Stromberg-Carlson Telephone Mfg. Co. Relates to the magnetic circuit of a telephone relay having main and auxiliary cores. An armature is supported in such a position as to be similarly actuated by the magnetization of either of both cores in either the same or opposite polarities.

1,088,879. March 3, 1914. TELEPHONE SYSTEM; H. P. Clausen, Rochester, N. Y.; assigned to Stromberg-Carlson Telephone Mfg. Co. Describes a central energy multiple type system, which includes a pair of relays adapted, upon display of both supervisory signals, to sever the talking strands of the cord circuits.

1,088,923. March 3, 1914. ELECTRICAL SOUND TRANSMITTER; M. E. Pearson, Seattle, Wash.; assigned to Long Distance Telephone Equipment Co. A transmitter for use on long distance circuits is described. The transmitter circuit has in its secondary winding an electromagnet including its armature and the receiver electrically connected with a plurality of resistance-varying devices, each provided with a removable electrode. Diaphragms are connected with each of the electrodes while a second diaphragm is operatively associated with the armature. The fluid medium co-operates with the armature diaphragm for influencing the diaphragms of the movable electrodes to impart alternating currents to the receivers.

1,089,394. March 10, 1914. CALL RECORDING SYSTEMS FOR TELEPHONE EXCHANGES; E. E. Clement, Washington, D. C.; assigned to Telephone Improvement Co. The recordiing outfit includes a special motor driven selector switch and printing mechanism adapted for use in connection with semi-automatic telephone systems. The number of the calling line is recorded and an indication is given as to whether the line called has answered or not.

1,089,040. March 10, 1914. FIRE ALARM SIGNAL BOX FOR AUTOMATIC TELEPHONE SYSTEMS; J. Erickson, Chicago; assigned to Denio General Electric Co. Relates to central office switching mechanism automatically controlled to establish connection between the subscriber's circuit and fire alarm headquarters. The calling mechanism is arranged so that it may alarm recording impulses.

1,089,426. March 10, 1914. TRANSLATING AND REGISTERING APPARATUS; E. C. Molina, East Orange, N. J.; assigned to American Telephone & Telegraph Co. Semi-automatic telephone equipment is described. It comprises selecting apparatus, a set of decimal keys and a registering mechanism having corresponding terminals connected to the keys and a movable member, co-operating therewith. The terminals, the movable member and contact means operated by its movement, are parts of a unitary register structure. Selection controlling mechanism is connected with the contact means and provided with terminals arranged in groups.

1,089,534. March 10, 1914. DIFFERENTIAL MICROPHONE REPEATER; J. J. Comer, Chicago; assigned to Automatic Enunciator Co. The feature of this patent is a cup partially inclosing the magnet, which has a cap carrying a diaphragm and a microphone transmitter.

1,089,673. March 10, 1914. TELEPHONE CUT-OFF; R. J. Robison, Romulus, Okla. The device is intended for use on rural lines. Means are associated with the switchhook for disconnecting the party line instrument from the line.

1,089,825. March 10, 1914. TELEPHONE TRANSMISSION CIRCUITS; Henry C. Egerton, Passaic, N. J.; assigned to Western Electric Co. This circuit is designed for preventing interference of one receiver with the other during the period of communication over one of the circuits. Two independent telephone circuits terminate at one station and receiving sets are connected, one in each of the circuits. Normally disabled resistances are provided for each line circuit connected in shunt to the receiving telephone of its line when the transmission apparatus is operatively connected with the other of the lines.

1,090,853. March 10, 1914. TELEPHONE LOCKING DEVICE; John W. Harvey, Sunset, Tex. This device is intended for desk telephones. It consists of a link and chain locking connector between the receiver hook and the base of the desk stand.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personal.

T. P. CAGWIN, commercial manager for the Cleveland Telephone Co., has been promoted to the position of commercial superintendent.

L. W. SHIPMAN, local manager for the New York Telephone Co., at Gowanda, N. Y., has tendered his resignation, and will go into the contracting business.

ALLARD SMITH, engineer for the Cleveland Telephone Co., Cleveland, Ohio, has been appointed general manager of the company, to succeed E. A. Reed, resigned.

T. E. HANAWAY has resigned his position as manager of the Monticello Telephone Co., of Monticello, Ind. Claude T. Bebee, of Logansport. has been appointed to succeed him.

C. H. ROTTGER, commercial superintendent for the Central Union Telephone Co., has been appointed general manager for the company in Illinois, with headquarters at Springfield.

L. D. TAYLOR, for the past year commercial manager of the Northwestern Telephone Exchange Co., at St. Cloud, Minn., has been promoted to the position of manager of the Fergus Falls, Minn., exchange.

L. S. COOK, local manager for the Iowa Telephone Co., at Ida Grove, Iowa, has been promoted to the management of the company's exchange at Audubon. Mr. Cook will be succeeded by Albert Allee, of Council Bluffs.

W. N. CASH, for the past three years manager of the Beloit, Wis., office of the Wisconsin Telephone Co., has been made district manager with headquarters at Janesville, his territory embracing Rock, La Fayette and Grant counties.

C. P. BRADFORD, local manager for the Central Union Telephone Co. at Akron, Ohio, has recently been made commercial manager of the Akron district. He will have supervision of all the Bell exchanges in northeastern Ohio, except Cleveland.

E. A. REED, who has served as general manager for both the Cleveland and the Central Union Telephone companies, has resigned the management of the former company and hereafter will give his entire time to the Central Union company.

CHARLES T. NOLL, who for the last year has been manager for the Huntingdon & Clearfield Telephone Co., at Indiana, Penna., has severed his connection with the company to accept a responsible position with another telephone company in the East.

WILLIAM BOYLAN, for over 10 years manager of the Raleigh, N. C., exchange of the Southern Bell Telephone & Telegraph Co., has resigned and will retire from the telephone business in order to give his personal attention more closely to his various property and investment interests.

G. F. BEATTY, formerly manager of the Fergus Falls, Minn., exchange of the Northwestern Telephone Exchange Co., has been made local manager at Grand Forks, N. D., to succeed V. M. Way, who resigned to accept a position as traveling salesman for the Park, Grant & Corrigon Co.

S. M. PALM, plant supervisor for the Bell Telephone Co. of Penna., at Allentown, has been promoted to the position of supervisor of methods, with headquarters at Harrisburg. Before his departure he was tendered a farewell banquet by the employes of the local exchange and was presented with an alligator skin portfolio and a hand bag.

G. H. MORGAN and S. L. MONAGHAN, the former manager of the government telephone exchange at Melbourne, Australia, and the latter assistant manager of the Sydney exchange, have been dispatched on a six months' tour abroad to investigate the latest developments in telegraphy and telephony. They will visit the United States, Great Britain and Europe.

BERT H. PECK, formerly electrical engineer for D. C. & Wm. B. Jackson, of Chicago, has assumed his duties as city telephone supervisor in charge of the telephone bureau of the city of Chicago. This bureau was created by the telephone rate ordinance passed by the city council on May 26, 1913, and is invested with the duties of investigating reasonable complaints of telephone service in the city, the enforcement of laws and ordinances relating to telephone service, the analysis of the rules and regulations of the various telephone operating companies in the city, and the collecting and compiling of statistical information regarding telephone service in this and other cities.

Obituary.

ISIDOR I. SPIRO, president of the Indianapolis Telephone Co., at Indianapolis, Ind., died recently at his home in Michigan City, at the age of 50.

CHARLES T. PERRIN, for many years commercial agent for the Wisconsin Telephone Co., in Oshkosh, Wis., died March 8, after a lingering illness.

FRED C. MILLIGAN passed away recently at Kenosha, Wis., at the age of 39 years. Mr. Milligan was engaged in the telephone business for nearly 20 years, holding various responsible positions with the Wisconsin Telephone Co. and the Chicago Telephone Co.

New Companies and Incorporations.

BUFFALO, IND.—The Citizens Telephone Co. has filed articles of incorporation with $8,000 capital stock. The incorporators are: George W. Fry, Idaville, M. H. Fry and J. H. Baker.

LARCHWOOD, IOWA.—The Logan Township Telephone Co. has been incorporated with $1,000 capital stock by John McCarty, Wm. Bunte and G. W. Kramer.

WINGO, KY.—The Mitchell Telephone Co. has been incorporated with $100 capital stock by W. H. Shelton, R. K. Johnson and H. W. Copeland.

SALT LICK, KY.—The Salt Lick & Moores Ferry Telephone Co. has been incorporated with $200 capital stock by John C. Atkinson, G. I. Meyers and John Otis.

WEEDSPORT, N. Y.—Articles of incorporation have been filed by the Economy Telephone & Telegraph Co. with $9,000 capital stock, to operate a telephone system in the towns of Cayuga county. The incorporators are: J. N. Mills, N. G. Taylor, F. H. Ball, J. M. Ingalls, and F. M. Parsons, all of Weedsport.

RYE VALLEY, ORE.—The Rye Valley Telephone Co. has been incorporated by W. D. Hiatt, D. Cartwright and G. L. Cartwright.

DUNLAP, TENN.—The Sequatchie Valley Mutual Telephone Co. has been incorporated with $3,000 capital stock by Landy Phelps, L. J. Lewis, R. O. Deakins, Fred Faris and W. B. Stewart.

OLYMPIA, WASH.—The West Side Rural Telephone Co. has filed articles of incorporation with no capital stock. The incorporators are M. E. George, Chas. E. Starr, Marion George, Wm. J. Countryman, James Houseman and C. J. Ford.

JUNCTION, WIS.—The Junction City Telephone Co. has been incorporated with a capital stock of $2,795. The incorporators are T. J. Pitt, N. P. Swanson, George Wolf, C. J. Huen and Henry Rux.

WHEELER, WIS.—The Wheeler Telephone Co. has been incorporated with $5,000 capital to construct and operate telephone lines and do a general telephone business. The incorporators are A. H. Breitengross, Robert R. Porter, Lewis Shaler, R. F. Breitengross and W. F. Ankney.

Construction.

SAUGUS CENTER, MASS.—The New England Telephone & Telegraph Co. has purchased a site and will erect a new exchange building in this town, to cost approximately $10,000.

BINGHAMTON, N. Y.—The New York Telephone Co. will erect a new three-story exchange building in this city, to cost $200,000. An additional $130,000 will be spent in improving the outside plant.

NEW YORK, N. Y.—The New York Telephone Co. has completed plans for the erection of a new 12-story exchange and office building, to cost approximately $1,000,000.

ERIE, PA.—The Union Telephone Co. is planning to install central energy exchanges at Greenville and Ellwood City.

PLAINVIEW, TEX.—The Southwestern Telegraph & Telephone Co. is rebuilding its entire system in this city, putting in a flash light system with modern switchboard, entailing an expenditure of about $50,000.

BLUE RIVER, WIS.—The Independent Telephone Co. has been granted a certificate of convenience and necessity by the Wisconsin Railroad Commission for the purpose of building a line from Blue River to Richwood, Richland county, and thence to Scott, Crawford county.

OSHKOSH, WIS.—The Wisconsin Telephone Co. has in contemplation extensive improvements to its local plant and equipment which will cost in the neighborhood of $500,000. This includes a $40,000 addition to the present exchange building.

SUN PRAIRIE, WIS.—The Interurban Telephone Co. is planning to install a new switchboard and replace its present wire system with cables.

Underground.

CHICAGO, ILL.—The Chicago Telephone Co. will lay 12 miles of cable on south side of the city, which will contain approximately 7,200 miles of wire.

TERRE HAUTE, IND.—Both the Citizens Independent and the Central Union Telephone companies are planning to place their wires in this city underground.

SUPERIOR, WIS.—The Peoples Telephone Co. is making arrangements for local improvements necessitating an expenditure of nearly $20,000, among which is included a considerable amount of underground construction work.

Financial.

SPRINGFIELD, MINN.—At the annual meeting of the Farmers & Citizens Mutual Telephone Co. a dividend of 15 per cent. was declared.

Elections.

GIBSON CITY, ILL.—The annual meeting of the stockholders of the Gibson Home Telephone Co. was held recently, at which the following officers were re-elected: President, Amos Ball; vice-president, C. M. Katterjohn; treasurer, John C. McClure; secretary, A. J. Parsons, of Springfield. J. F. Stephen is retained as manager of the company.

FARMERSBURG, IND.—The stockholders of the Farmersburg Telephone Co. have elected the following directors for the ensuing year: Luther Patten, Finley Owen, James Wood, Frank McClanahan, George Blair, John A. Curry and Samuel Morris.

GARRETT, IND.—At the annual stockholders' meeting of the Garrett Telephone Co. the following officers were elected for the ensuing year: President, John B. Mager; vice-president, S. B. McCullough; secretary, C. N. McCully; treasurer, L. D. Mager; general manager, D. B. Van Fleit; assistant treasurer, W. W. Sharpless. In addition to the above W. H. Grube, John Brechbill, B. G. Halstead, R. E. Guild and C. M. Nesbitt were elected directors.

MCPHERSON, KANS.—At the annual meeting of the McPherson Rural Telephone Co. officers for the ensuing year were elected as follows: W. H. Blackman, president; Anson Clark, vice-president; J. D. Poulsen, secretary; C. A. Guy, treasurer. The officers together with W. S. Garst, Ray Stockham, Peter Mugler, Martin Gibson, J. W. Yowell, W. J. Young, B. J. Hull, P. W. Webb. Gust Olsen, Van Kubin, and W. E. Muse constitute the board of directors.

CHATFIELD, MINN.—At the annual meeting of the People's Telephone Co. the following directors were re-elected: S. Burnap, Hugh Currie, T. W. Peas, B. W. Huntley, F. G. Stoudt, H. Brown and E. J. Colby. The board elected the following officers: President, S. Burnap; vice-president, Hugh Currie; secretary, F. G. Stoudt; treasurer, T. W. Pease.

FIRTH, NEB.—The Firth Telephone Co. held its annual meeting recently and elected officers for the coming year as follows: J. P. Tickner, president; John Boesiger, vice-president; J. C. Ruigh, secretary and treasurer. The directors are: Fred Hartweig, A. TenHulzen, E. Harms, John P. Kleck, M. Kallemeyn and James DeBoer.

WILCOX, NEB.—At the annual meeting of the Wilcox Telephone Co. the following officers were elected: President, I. H. Jordan; vice-president, Dr. Burford; secretary and treasurer, O. L. Marsteller.

STAFFORD, N. Y.—At the annual meeting of the Stafford Telephone Co. officers for the coming years were elected as follows: Charles J. Call, president; George H. Torrey, vice-president; Howard Bell, secretary and manager; E. W. C. Pamphilon, treasurer.

DAYTON, OHIO.—At the annual stockholders' meeting of the Home Telephone Co. the following directors were elected: G. R. Johnson, Columbus; Frank A. Davis, Columbus; F. L. Beam, Mt. Vernon; F. W. Stevens and F. H. McKnight, New York; H. C. Kiefaber, J. T. Barlow, F. J. Ach, Joel O. Shoup, A. McL Marshall and Thomas Elder, of Dayton.

BENTON, PA.—At a meeting of the stockholders of the Northern Central Telephone Co. the following were elected directors: T. C. Smith, John J. Mather, Ellis Eves, Dr. John R. Yorks, C. M. Laubach, C. E. Yorks, O. B. Ammerman, Wm. C. Hosler, and A. B. Mendenhall. At a subsequent meeting of the directors officers elected for the coming year, were as follows: President, T. C. Smith; vice-president, W. S. Laubach; treasurer, John J. Mather; secretary and general manager, C. E. Yorks.

Miscellaneous.

HILLSBORO, ORE.—The Hillsboro Telephone Co. has sold a controlling interest in the system to Charles E. Wells, of Kingsville, Tex., who proposes to make a number of improvements to the plant. The deal involves an investment of about $20,000.

MART, TEX.—The Brazos Valley Telephone & Telegraph Co. has converted the local switchboard from a central energy visual type to a lamp board and has also overhauled and extended its outside cable plant.